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DETERMINANTS OF FEMALE ENTREPRENEURSHIP: EVIDENCE FROM GEM DATA

Master's Thesis by the 2nd year student
Concentration – International Business,

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ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ
ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

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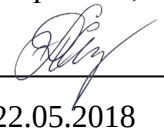

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I, Khlibyk Alina Alekseevna, second year master student, program «Management», state that my master thesis on the topic «Determinants of Female Entrepreneurship: Evidence From GEM Data», which is presented to the Master Office to be submitted to the Official Defense Committee for the public defense, does not contain any elements of plagiarism.

All direct borrowings from printed and electronic sources, as well as from master theses, PhD and doctorate theses which were defended earlier, have appropriate references.

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АННОТАЦИЯ

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Название ВКР	Детерминанты женского предпринимательства: на базе проекта GEM
Факультет	Высшая Школа Менеджмента
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Научный руководитель	Ольга Рафаиловна Верховская
Описание цели, задач и основных результатов	Цель данного исследования – оценить факторы, которые влияют на разные стадии женского предпринимательства в развитых странах. В ходе работы был проведен широкий анализ теоретических исследований женского предпринимательства, в результате чего были сформулирован интегральный набор факторов, влияющих на уровень женского предпринимательства: институционального и персонального характера. В результате теоритического обзора были выдвинуты гипотезы для каждого фактора. Для проверки поставленных гипотез была собрана выборка данных по развитым странам с 2011 по 2017 годы. Источником данных стали Национальный опрос экспертов и Опрос взрослого населения базы данных GEM. Для анализа был применен количественный анализ панельных данных. Модель метода наименьших квадратов, модель случайных эффектов и модель фиксированных эффектов были использованы для стадии ранней предпринимательской активности и устоявшегося бизнеса женщин-предпринимателей в рассматриваемых странах. На основании количественного анализа было выявлено, что на ранней стадии культурная поддержка, специализированное образование, нетворкинг и занятость в секторе услуг положительно влияют на бизнес женщин-предпринимателей. В то время как на второй стадии значимы такие факторы как образование и недостаток финансов. Государственная поддержка, неуверенность и занятость в техническом секторе не оказались значимыми факторами. Дополнительно аналогичный анализ был проведен для мужского предпринимательства на данной группе стран, которые показал результаты, частично отличающиеся от женского предпринимательства. На основании проанализированных результатов были указаны теоретическая и практическая значимость исследования, а также возможные способы развития женского предпринимательства.
Ключевые слова	Женское предпринимательство, факторы, GEM

ABSTRACT

Master Student's Name	Alina A. Khlibyk
Master Thesis Title	Determinants of female entrepreneurship: evidence from GEM data
Faculty	Graduate School of Management
Major subject	International Business
Year	2018
Academic Advisor's Name	Olga R. Verkhovskaya
Description of the goal, tasks and main results	The goal of the study is to evaluate factors that influence female entrepreneurship on different stages of running business in developed countries. In order to achieve the stated goal the author analyses theoretical background of female entrepreneurship. The extended overview of researches leads to formulation of integrated set of factors widely discussed in academic research: institutional and personal-related ones. Based on literature review the hypotheses are stated for each of the factor. To test the hypotheses the panel dataset was created for developed countries for 2011-2017. The data was collected from national experts survey and adult population survey of GEM. The quantitative analysis for panel data was applied. The OLS, random-effects, fixed-effects models were ran for total entrepreneurial activity stage and established business stage for female entrepreneurs. Based on the empirical results the study identified that on early stage of running a business cultural support, training and education, networking and service sector share have influence on female entrepreneurial activity, whereas for established business phase training and education and lack of finance are significant. Governmental support, lack of confidence and technological sector do not play a role at any stage. Additionally, the same models were ran for male entrepreneurial activity levels on both stages, showing similarity with female results in training and education, cultural support and service sector, other factors showed different results. Theoretical and practical value of the research as well as potential measures to promote female entrepreneurship were discussed.
Keywords	Female entrepreneurship, factors, GEM

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Introduction

Nowadays women's entrepreneurship is seen as a potential for economic and social development. The number of women starting and running new businesses is growing and the benefits of this are depicted by researchers (GEM 2017). The World Employment and Social Outlook: Trends 2015 report notes that even though gender gaps persist in the labor market and that women still suffer from greater unemployment and lower earnings, there are significant benefits to encouraging and supporting women's entrepreneurship as women entrepreneurs contribute substantially to economic growth and poverty reduction (International Labour Office 2015). A number of studies and programs state that contribution to welfare obtained from female entrepreneurship is even higher than from the activity of men. At the same time, however, the number of women entrepreneurs is significantly lower than men. Despite of scarce attention paid to gender differences in entrepreneurial behavior, the reasons of such differences are even significantly less understood (Minniti 2010).

In this paper a wide range of empirical research on female entrepreneurs is analyzed and on its basis it can be stated that most researches verify existing differences in female and male entrepreneurship, however, there is no integrated study of factors that make impact on female entrepreneurship. Factors are mentioned by one or several in different researches, however, there is no common classification depicted in researches that could summarize the studied factors.

Moreover, the current work evaluates the depicted factors within developed countries for theoretical and practical reasons: usually researches are conducted for a specific country and there exists a scarce number of works with analysis run for a set of countries, specifically for developed. At the same time, the developed countries are the ones that mostly act towards gender issues in policy and business by incorporating specific support measures. Thus, the current research will reveal how the derived from theoretical review factors influence female entrepreneurship in developed countries. Additionally, the study is extended by evaluation of factors not generally for female entrepreneurs, but for specific stages of entrepreneurship: setting up and nascent business and established one, which contributes to better understanding on what stage stakeholders can potentially improve use of the discussed factors for better female entrepreneurship development and support.

Hence, the research problem of the paper is that although differences between female and male entrepreneurs are recognized and researched, factors that influence female entrepreneurship are not clearly defined; and there is no integration of factors important for female entrepreneurship. At the same time, there is a scarce number of works dedicated to a holistic view on developed countries and different stages of running business for females are not

considered as well. Thus, the research goal of this work is to evaluate factors that influence female entrepreneurship on different stages of running business in developed countries. The research questions to be solved are 1) to create a set of determinants influencing female entrepreneurial activity; 2) identify how the revealed determinants influence female entrepreneurial activity at different stages of running business in developed countries.

Analysis of factors via literature research resulted in an integration of factors including two major blocks: institutional and personal-related factors. Institutional factors consist of obtaining finance, governmental support, and cultural support of entrepreneurship. While personal-related factors are of two groups: firstly, social ones including training and education and networking; and secondly, behavioural factors including confidence and sector choice. After factors are identified from the theoretical overview, the hypotheses are stated grounded on considered research. Lack of financial capital and lack of confidence are stated to have negative influence on female entrepreneurship activity. On the contrary, governmental support, cultural support, training and education, networking and service sector share are considered to have a positive influence. Only technological sector share is stated to have no influence on female entrepreneurial activity.

The methodology chosen for research is exploratory quantitative analysis run on the dataset of panel data consisting of innovation-driven (developed) countries for 2011-2017 years for two stages of entrepreneurship stated by GEM: total entrepreneurial activity (less than 3.5 years existing business) and established business (more than 3.5 years existing business). The main source of variables chosen to test stated hypothesis based on literature review are the following datasets: National expert survey and Adult population survey of GEM, depicting institutional and personal-related factors included in the derived factor classification.

The results obtained are the following: different factors have influence on female entrepreneurship at various stages stated in analysis. On the stage of total entrepreneurial activity, when a business is run less than 3.5 years, analysis reveals that cultural approval, training and education, networking and consumer oriented sector choice are significant and have a positive influence on female entrepreneurship activity. On the second stage of established business lack of finance, training and education are significant with character of influence as stated in hypotheses. It is noteworthy that training and education factor turned out to be important on both stages, contrary, governmental programs, lack of confidence and technological sector share were significant at none stage. Additionally, within discussion of obtained results there were also stated results of the statistical analysis ran for male entrepreneurs and compared with females'. All results are elaborated on within discussion part.

Consideration of implications is provided in the paper. From theoretical standpoint the paper contributes to the topic of female entrepreneurship by analyzing a wide range of researches of female entrepreneurship and introducing integration of factors classifies into institutional and personal-related groups. Moreover, the derived factors are tested on the set of developed countries which together are rarely reviewed in literature. Additionally, the factors are tested for 2 different life stages of female entrepreneurship which was not done in researches so far.

As for practical recommendations, obtained results can be of high value for promoting female entrepreneurship. This can be achieved by introducing programs improving cultural approval of female entrepreneurship in society within educational institutions and role –model programs; incorporating gender dimension in governmental programs; stimulating access for females to business specific education and training; promoting networking via association or companies' programs; and increase females presence in technological entrepreneurship via educational and research institutions and technical communities. The concluded implications can be further used by governmental policies, professional association networks, educational and research organizations and other stakeholders to spur female entrepreneurship.

With regard to work structure, the paper consists of six main parts. The work starts with introduction, followed by theoretical overview. The theoretical part covers researched on female entrepreneurship and discusses the mentioned factors, next, the factors are set together in classification, research gap, problem and questions are stated, and hypotheses statements finish the first chapter. The second chapter offers evaluation of factors influencing female entrepreneurship from the first chapter. It includes research methodology, design, sources of data, explanation of variables and data analysis itself with outputs from STATA statistical package, then, the obtained results are discussed and implications are provided in the end of second chapter. Conclusion, list of references and supplementary materials are provided.

1. Theoretical overview of female entrepreneurship

1.1. Entrepreneurship notion

The complexity of entrepreneurship concept explains numerous researches that investigate favourable factors for development and find differences in how these factors influence various groups of entrepreneurs. There were a lot of trials to identify entrepreneurship essence starting with Schumpeter (1934). Since then, there was a huge number of academic researches which can be summarized in three major approaches to entrepreneurship: economic, trait and social identity. *Economic* approach to entrepreneurship is regarded as combination of different production factors which is aimed at getting profit on investment by using knowledge about product demand (Rothbard 1995). Within this approach managerial role of entrepreneur is emphasized as well. Still, it does not explain motivational aspect of becoming entrepreneur. *Traits* approach underlines significance of certain traits profile for an entrepreneur. A set of characteristics defines predisposition for entrepreneurship, thus categorization of entrepreneurs is typical for traits approach (Gartner 1988). *Social identity* approach comes from sociology and states that entrepreneurship is not about personality of individual, but a collaboration of individual, society and culture. Down and Warren (Down and Warren 2008) define social identity not as a trait of a particular individual, but as identity attained in process of social interactions. Thus, for the concept of entrepreneurship it means that entrepreneurship does not depend on traits of individual, but is a process of decision-making on how to set a company, establishment itself and exploitation of it. It may be argued that a person plays a central role in it, however, there are more actors to take part in this process: identity is constructed through ongoing interactions with social networks. As far as entrepreneurs are supposed to be those who combine difference resources to make extra value, resources can be obtained from various social networks in which entrepreneur takes part (Kloosterman and Rath 2001).

In order to understand when gender issue in entrepreneurship evolved in academic researches we should look back at approaches to entrepreneurship. Within a trial approach social categorization is applicable which gives ground for highlighting gender differences as a criterion to diversify entrepreneurship. Less females being entrepreneurs than men has been demonstrated in numerous later researches. Still, traits theory gave a start to classify entrepreneurs on gender base (Peverelli and Song 2012).

1.2. Development of female entrepreneurship research

In order to identify what factors are being considered important and having impact on female entrepreneurship we will refer to the research in historical context: it will assist in identifying how the research evolved, which factors were considered and explained in academic researches. Based on the factors we will identify via research overview, the generalized framework will be offered.

1.2.1. Early research before 1990s

Historical analysis shows that researches on female entrepreneurship trace back to the 1970s. One of the earliest researches to be made was "Entrepreneurship-New female frontier" by Schwartz (Schwartz 1976). The results of his research showed that reasons of starting female entrepreneurship are similar to male and that women had similar to men's entrepreneurial qualities (which is a bit contradicting to traits approach). Results showed that so-called "internal" differences were minimal. However, he identified external barriers being higher for women and that they impede companies' success. The major barrier identified by Schwartz was obtaining financing.

Later a new investigation was published by Decarlo and Lyons, in which 122 women took part. It helped them to describe a profile of female entrepreneurs and compare with other female groups. The results of this research was an attempt to identify women entrepreneurs profile, researchers also found out that female entrepreneurs differ from women in general. Still, they highlighted more need in additional research on this topic (Decarlo and Lyons 1979).

There is definitely very scarce number of article on female entrepreneurship published in the 70s. However, starting from the next decade, there appeared more and more works which can be explained by a shift in labour force: females started to take more active part in labour market, even in role of business owners. The later studies in 1980s also continued to note impediments that women face while starting their own business.

In 1980s two researchers Hisrich and O'Brien in US made a series of research that they extended during a decade and contributed to findings of female entrepreneurs. Just a few years after Decarlo and Lyons research, in 1981 Hisrich and O'Brien continued examining female entrepreneurship came up also listing barriers for women to start or develop business. These hurdles were again obtaining financing, getting guarantees and even overpassing negative image of females that used to be in society in that time. Results of the survey reviled that reasons lied not in education or expertise of interviewed females rather than in types of business they obtained. Hisrich and Brush continued their research and 3 years later published results of new survey of almost 468 entrepreneurs and managed to create their profiles, describe skills and

motivation together with characteristics of business and problems they faced. This study was later followed by a longitudinal one which Hisrich and O'Brien published in 1987. It again contained information on female personal features, family background, eagerness to take risks, management skills, problems they faced and business growth rates.

At that time researches were conducted not only in the USA, but in the UK as well. Watkins and Watkins' research revealed that differences between male and female characteristics were not of biological character but of social. Precisely, thanks to external factors and conscious intentions women were considered to be eager to work in business area accepted by society of women's presence, i.e. stereotypically women's spheres (Watkins and Walkins 1983).

Another interesting research on gender stereotypes followed from Buttner and Rosen 5 years later. They identified influence of gender stereotypes when women were trying to get credits in banks. Surprisingly, loan offices were prejudiced about women being able to achieve success in comparison to men (Buttner and Rosen 1988).

Another UK researcher Carter found out that the way women were doing business and results they received were specific to their condition. Differences were viewed in personal behavior, ambitions and motivation which is contrary to results of Buttner and Rosen (Carter 1988).

All in all, there is ground to make a conclusion that women face some impediments due to gender biased social perceptions that become as external factors that reflects how society perceives female entrepreneurs and, thus, which barriers are formed in environment for women to start or operate business, and simultaneously as an internal factor, meaning that self-perception of women due to existing stereotypes changes and their behavior is aligned accordingly.

Another round of research was devoted to social integration in terms of women and men comparisons. Researchers Aldrich, Reese and Dubini made an interesting study which identified substantial discrepancies between social networks made of women and men separately. Men intended to form wider social networks which significantly helped them in starting or running the business. Thus, we are going back to social identity theory of entrepreneurship which states that social integration plays an important role. It occurred that women and men indeed had discrepancies in this criterion (Aldrich, Reese and Dubini 1989). Later on Cromie and Birley continued research in this direction and came to the following results: females were supposed to be not that active as men in interpersonal communication, thus, networks they developed were less dense and, what is interesting, they considered members of family to be most important part of their networks (Chromie and Birley 1992).

Up to that time quantitative researches prevailed and they mostly covered how male and female entrepreneurs differ in terms of demographics, occupation, family relations and education. Still, a specific article was found, author of which tried to make a more descriptive research and, thus, combined interviews with open-ended questions and psychological testing and observation. A result of research was a drawn "psychological profile" of female entrepreneur which mentioned particular features as assertiveness, ability to influence others, high energy levels (Neider 1987).

The theoretical base of early researches on female entrepreneurship in the 1970s and 1980s covered quantitative and empirical methods of analysis, aim of which was to understand a profile of female entrepreneur. These were the first trials to introduce concerns on female entrepreneurship. Their results also included mentioning such issues as gender stereotypes and individual characteristics that impacted a gap between male and female entrepreneurship. Summary of main ideas discussed in overviewed researches is presented in the Table 1.

Table 1 Summary of early research review on female entrepreneurship before 1990s

	Topics discussed	Literature source
Financing	"Internal" differences between females and males are minimal, however the major barrier identified for female entrepreneurs is obtaining financing Difficulties in getting finance; loan offices prejudiced about women being able to achieve success in comparison to men	Schwartz 1976 Hisrich and O'Brien 1981 Buttner and Rosen 1988
Psychological profile	Described a profile of female entrepreneurs and compared with other female groups "Psychological profile" of female entrepreneur, features mentioned as assertiveness, ability to influence others, high energy levels	Decarlo and Lyons 1979 Neider 1987
Social approval	Differences between male and female characteristics were not of biological character but of social, women considered to be eager to work in business area accepted by society of women's presence	Watkins and Walkins 1983
Networking	Men intended to form wider social networks which significantly helped them in starting or running the business	Aldrich, Reese and Dubini 1989 Chromie and Birley 1992

Type of business obtained	Results reviled that reasons lied not in education or expertise of interviewed females rather than in types of business they obtained	Hisrich and O'Brien 1981

1.2.2. Research before 2000s

In the 1990s research on female entrepreneurship spread over Europe and the USA. For example, situation in Asia started to be explored. In their article Chew and Yan examined China where female entrepreneurship had a sharp increase since late 1970s (Chew and Yan 1991). Other Asian researchers, Hisrich and Fan focused on Singapore (Hisrich and Fan 1991). Despite the fact that topic of female entrepreneurship in Asia had not been risen before, both articles revealed results of typical profiles of female entrepreneurs in these countries.

The already mentioned researchers Lee-Gosselin and Grisé continued their previous research (Lee-Gosselin and Grisé 1990). In this researched they changed their definition of entrepreneurship and aligned research to women's professional, family, personal and social needs. There initial research was based on a survey of 400 women in Canada, but later they chose 75 of those women and made a comprehensive interview with them. Researchers were especially interested in personal traits of females, specifics of their companies, prior expertise, how they evaluate success of business, and ideas on future of their business. The main result of the work was identification that females opt for small and stable business models, the reason for this is to save their life quality and compromise family life.

In late 1990s Leahy and Eggers conducted multiple regression analysis and came to an interesting conclusion that females were more intensely focused on tasks rather than men, though earlier there was an opposite belief. Thus, researchers stated that many investigations were influenced by stereotypes and supposed that certain skills were part of women's essence (Leahy and Eggers 1998).

There was a streaming of researches that compared behaviors of men and women, however, researchers did not come to the common ground. Some stated they their behaviours are similar (Sexton and Bowman-Upon 1990; Fagenson 1993), others came to conclusion that differences lied in nature (Leegosselin and Grise 1990; Aldrich, Reese and Dubini 1989). White Cox also supported difference theory and attributed special "creative and political style" to women which together with existing gender identity had influence on women's behavior (White Cox 1997).

Interestingly, research of Fasci and Valdez showed that male-led companies were more lucrative than those managed by women. Still, they mentioned that differences in results were because of market conditions and context variables (Fasci and Valdez 1998).

In 1993 three researches published a work that was a step up in discussions on female entrepreneurship. Fisher, Reuber and Dyke believed that in order to explain female entrepreneurship they could use feminist theories. Thus, they considered 2 theories: so-called liberal feminism and social feminism. The former claimed that females were disadvantageous in comparison to males because of discrimination issues that gave women less access to key resources as education and expertise in business. The latter, on contrary, argued that discrepancies were caused by existing process of differentiated socialization that influenced results of women in entrepreneurship.

The comparison in terms of liberal and social feminism was continued by Hisrich et al. They desired to implement theories on performance of companies ran by women and men, because before these studies were based mainly on quantitative analysis. They came to conclusion that feminist theories were applicable to entrepreneurship, at the same time, they offered to study female entrepreneurship apart from theory of entrepreneurship itself as throughout the study internal and external variables showed presence of gender similarities and discrepancies (Hisrich et al. 1997).

Dolinsky, Caputo and Pasumarty went further and examined influence of color and gender on entrepreneurship. Their findings asserted that black women became entrepreneurs less frequently than white women. Their analysis was based on longitudinal trends of employment levels of both groups and identified the reason for this difference. Black women rarely became entrepreneurs due to historically lower access to credit (Dolinsky, Caputo and Pasumarty 1994).

A research made by Zapalska in Poland was devoted to check whether female entrepreneurs had entrepreneurial characteristics needed to get effective performance. Research involved 150 women and men involved in entrepreneurship. What Zapalska came for was that women indeed had a set of features necessary for success: persistence, devotion, aggressiveness, independency, communication and leadership skills, innovativeness, responsibility, and lower requirement for support and lack of emotionalism compared to other women. All these results meant that female entrepreneurs actually obtain characteristics similar to male. He pointed out that the previous studying underlined women as weaker and having more tendency for emotions than men. However, what he investigated was that Polish women entrepreneurs had a profile and qualities essential for success similar to men regarding motivation. His conclusion was that entrepreneurs themselves possessed a particular set of characteristics despite gender (Zapalska 1997).

With regard to methodology used in researches, Stevenson claimed to avoid limitation by quantitative research (Stevenson 1990). He said that use of exceptionally quantitative methods to examine female entrepreneurship phenomena was a methodological problem because they did not take context into account. Therefore, he opted for use of qualitative methods of research as they assisted in understanding role of relationships in female entrepreneurship. For these reasons he conducted interviews and wanted females to comment on these relationships.

Summarizing the research made in the 1990s there definitely was a surge in number of works examining female entrepreneurship which brought greater results and more data for consideration. Still, we have to admit that a lot of researches raise a topic of stereotypes and bringing characteristics specific to females in comparison with males. The central idea in this approach was that women had different behavior because of obtaining special "essence". Although there still appear publications with similar results, apparently, 1990s were characterized by a new wave of studying which attributed differences between men and women to the way they were trained, brought up and educated in society. Thus, there appeared a new streaming that gave more important role to social construction and factors rather than natural characteristics to performance and decisions of female entrepreneurs. Summary of main ideas discussed in overviewed researches is presented in the Table 2.

Table 2 Summary of early research review on female entrepreneurship before 2000s

	Topics discussed	Literature source
Type of business obtained	Females opt for small and stable business models, the reason for this is to save their life quality and compromise family life	Lee-Gosselin and Grisé 1990
Psychological profile	Females were more intensely focused on tasks rather than men, though earlier there was an opposite belief Special "creative and political style" attributed to women Entrepreneurs themselves possessed a particular set of characteristics despite gender	Leahy and Eggers 1998 Fagenson 1993 White Cox 1997 Zapalska 1997 Hisrich et al. 1997
Obtaining finance	Black women rarely became entrepreneurs due to historically lower access to credit	Dolinsky, Caputo and Pasumarty 1994

1.2.3. Research after 2000s

The significant increase in academic investigations on female entrepreneurship took place after the 1990s. It would be challenging to mention a holistic overview of most of them. Thus, I would refer to the works that raised most widely discussed topics. Noteworthy, the highly discussed topics covered females' competences, behavior, opening new business, access to finance. In addition, thematic areas included training and specific education, public policy, social identity, company's success factors.

In 1999 Brazilian researcher Machado took into account national context. He analyzed patterns of managerial behavior of female entrepreneurs and found that most researchers analyze this topic from national characteristics' perspectives (Machado 1999).

The idea of special women's "essence" continues to be discovered after 1990. And there appeared a number of works that examined skills and behaviors of businessmen and –women and came to the conclusion that female management style has a set of different characteristics. Their profile was supposed to be characterized by such features as sensitivity, teamworking ability and even intuition. These features were theoretically and empirically demonstrated in researchers' works (Cook, Belliveau and Lentz 2007; Walker and Webster 2006; Cantzler, Leijon 2007).

As it started to evolve after 1970s, after 1990s a lot of researchers stated influence of females' socialization on their experience contrary to traits of "essence". Some studies did not see much difference in competence of men and women and the way they behave, but admitted that performance of business, readiness to take risks and strategic decisions were connected with values, expertise and personal traits of individuals (Boohene, Sheridan and Kotey 2008; Mezies et al. 2006). A study by Verheul, Stel and Thurik came to interesting conclusions, opposite to what was believed before, that female-ran enterprises were more control-oriented than those ran by males and that female entrepreneurs let their employees less space for participation and were more concentrated on themselves within an organizational structure (Verheul, Stel and Thurik 2003).

Moreover, literature also discussed stereotypes issues raised in culture. Competing family responsibilities and business matters (being a good mum and dutiful wife), culture and societal expectations, running home-based business and building trust were found as main influences on female entrepreneurial networking behaviours. The majority revealed stressful times trying to combine the business with multiple roles and societal expectations (Hechavarría et al. 2015; Surangi 2017). National context of culture is also highlighted by Pathak et al (Pathak et al. 2013).

There also appeared a new branch in researches. Some studies identified different types of female entrepreneurship based on major motivational reasons. These entrepreneurship types are *necessity-driven entrepreneurship* and *opportunity-driven entrepreneurship*. As a result such division shows a surprising finding: the share of female entrepreneurs is higher in countries with low income per capita, explained as a necessity to earn leaving (Malach Pines A. et al 2010). Similar terms used in entrepreneurship theory to explain influencing factors are "push" – that necessitate people to start business – and "pull" ones – that make favourable environment for it (Orhan and Scott 2001). Another research also contributed to this theory. Diegues-Castrillon et al. researched Spanish Galicia region with regard to impact of gender on females' decision to diversify activities in countryside areas for tourism. Researchers found 2 phenomena in these areas: women perceived economic aspect to be more motivating while running an enterprise in rural tourism, contrary to men. When they chose a company oriented on rural tourism, they took into account opportunity to generate profit that would assist in financial survival (Diegues-Castrillon et al. 2012). It is an opposite approach to one that highlights females' main objectives as social or family relationships in comparison to economic. The main conclusions that can be drawn here state that women are more vulnerable to poverty, entrepreneurship as an occupation can assist females in improving economical advancement and female entrepreneurship can be a way of increasing economic growth, but needs encouragement.

Another branch of research that continued after 1990s regarded getting *finance* for starting business and access to *venture capital*, and mostly questioned why women made fewer loans than men. In this respect studies also did not come to the common ground. Some researchers stated that actually there was no discrimination in a process of obtaining a credit (Wilson et al. 2007). Other researchers, on opposite, found signs of discrimination (Carter et al. 2007). Carter's research is great example of combination of qualitative and quantitative research: thanks to experimental methods together with qualitative ones, they found an interesting dependency: particular evaluating criteria for loan applications had different emphasis depending on whether bank loan officers were male or female. Gicheva and Link (2015) investigate access to funds for the development of new technologies, determining that female entrepreneurs have less access because of the view held of their performance by financing systems. The results of some research confirm the existence of a gender gap in the net profit, employment growth rate, return on assets (ROA) and in use of various types of alternative financing sources (Stosic 2017).

However, some researchers continued work on this topic and came to other results: women indeed received less funding, nevertheless, the reason was not a gender discrimination but reluctance of women to seek for foreign capital, and as a result they had less resources. According to some researchers that difference in behavior took place because of being risk-

averse. Another researchers, Orser, Riding and Manley, searched for gender differences within Canadian small and medium enterprises owners who looked for external financing, for example, leasing, commercial debt, equity capital and supplier financing (they controlled variables of size and industry). As a result, they found out that female entrepreneurs were in the same way as men considering all types of external financing with exception to equity capital. As well males and females were equally likely to receive capital (Orser, Riding and Manley 2006). Harrison and Mason came to another interesting conclusion: they researched particularly venture capital access and concluded that females got little venture capital because they seldom searched for such kind of financing and if they actually did, they preferred female investors, simultaneously, male preferred venture capital from male investors (Harrison and Mason 2007).

Another part of researchers were seeking for the reasons of enterprise development and performance. Researchers came up with different reasons such as again financial difficulties, having not enough managerial and business skills, impediments of market and distribution, limited participation in professional networks, not sufficient institutional and government support, lack of innovations, constraint in balancing personal, family and business demands.

With regard to the type of business run by female implications of Hampton research for policy suggests that more needs to be done to encourage women venturers to develop technology-based enterprises both in Northern Ireland and further afield (Hampton 2011).

In the sequel of necessity-orientated entrepreneurship, after 1990s studies of minority groups also became interest of "female entrepreneurship" researchers. These studies investigated entrepreneurial orientation of ethnic minorities in socioeconomically disadvantaged situation and stated that females had to start their own business as alternative employment for themselves and families. Still, they start business rarely compared to natives due to lower levels of assets and education. For example, Fairlie came to such conclusions while analyzing disadvantaged minorities in the United States (Fairlie R. 2005). Saridakis et al. (2014) indicate that negative macroeconomic situations lead women to create needs-based businesses generally in activities in which they have no skill in finding the necessary resources within the family circle. Such studies raised discussions about need of special institutional policies to stimulate these groups to become entrepreneurs. At the same time some researchers state that Women may perceive opportunities differently from men. If, for instance, women's self-perceptions are tightly linked to family responsibilities this may influence their preferences for settlement, employment and entrepreneurship (Reichborn-Kjennerud and Svare 2014).

Researchers also have a very controversial view on public policy towards entrepreneurship. The majority of entrepreneurship policy studies lack gender-based analysis (Orser and Elliott 2015), and few gender studies on women's entrepreneurship articulate policy implications (Foss et al. 2014). To Natividade (2009), national public policies over the 2002-2007 period aimed at "female entrepreneurship", especially for necessity-driven female entrepreneurs, were insufficient. The ministries participation and availability of budgetary resources for supportive policies was quite minor. At the same time, Botha, Nieman and Vuuren (2006), Lerner, Menahem and Hisrich (2005), reported the successful experiences of programs focused on the empowerment of women entrepreneurs. The first researchers found that females in an experimental group participating in a Women Entrepreneurship Program (WEP) in South Africa attained new skills and knowledge that contributed to their businesses, as opposed to those who were part of the control group and were not assisted by the program. Later researchers overviewed a positive impact of a government intervention program focused on the professional development of Soviet and Asian immigrants in Israel. In more recent Colette research, the gender barriers discussed earlier in this paper suggest that women entrepreneurs, despite their growing numbers and contributions, are still not valued and recognized as an integral part of the entrepreneurial ecosystem and environment. This weakness in the normative pillar, in particular, highlights the need for an entrepreneurial ecosystem that encompasses and embraces women entrepreneurs as well as public policies that address normative as well as regulative and cultural/cognitive factors (Wilson, Kickul and Marlino 2007).

Another interesting streaming of research referred to training and education of female entrepreneurs that could help women run more competitive business (Wilson et al. 2007). In research of Handy (Handy et al. 2007) a positive relationship between schooling and female entrepreneurship was found. He made empirical studies on behavior of female entrepreneurship in India in both profit and non-profit sectors in which half of 40 respondents had a post-graduate level of education. The results showed that business-women with higher education could easier negotiate administrative requirements which are necessary to start business in comparison with less educated business women. Similarly, Coleman was studying performance of small firms owned by women in the United States and found that they underperformed those owned by men. He defined performance by measures of profitability and growth. His research suggested that women were less prepared for business ownership than men in the area of human capital. Typically, women were less likely to be educated in the business disciplines and had fewer years of management experience. Results revealed that, in terms of profitability, prior business experience was significant and positive in both profitability models for women and in one of the two profitability models for men. Educational levels were also significant in one of the

profitability models for women (Coleman S. 2007). Seuneke and Bock (2015) also consider the capacity for learning a factor that improved practices in women's business ventures. Tegtmeier and Mitra also highlight importance of education for female entrepreneurs in their research (Tegtmeier and Mitra 2015). In research of Bianchi, 2016 universities are stated to play a crucial role in several areas. The potential may be pursued at the level of teaching that promotes interdisciplinary and soft skills and that is able to convey positive model roles for women. At the same time, active tutoring and the creation of collaborative processes that stimulate self-confidence are important for realizing the potential of women (Bianchi 2016).

Besides their teaching and research mission, universities could embrace more fully and promote a culture of entrepreneurship that constantly interacts with the economic and social environments in which universities operate.

Another factor considered positive for business creation is networking as a part of social capital. Social capital is supposed to be an asset embedded in relationships of individuals, communities, networks or societies. The advantage is that social networks can provide access to human capital, financial capital and other types of capital. As entrepreneurship is a social activity, studying it through lenses of social capital can be very helpful. Usually social capital is divided into three categories: organizational level, societal level and individual level. First type, organizational social capital, is the relationship of the members of an organization, which main goal is to engage in a collective action. Societal level examines the impact it has on the society. And finally, individual level of social capital consists of the set of non-formal relationships formed with college friends, old colleagues, spouse, relatives etcetera. Individual level of social capital in form of networks is most important for entrepreneurship as it can help to perceive business opportunities, provide valuable industrial specific information and contribute to a person's entrepreneurial goals (Hoangv and Antoncic 2003). Thus, a number of researches were done on individual social capital and the way person's social network influences the decision to become self-employed.

Two important key factors during the start-up phase of a business are capital and skills. An excited entrepreneur can have new business ideas, but might not be sure whether they are realistic and feasible. Thus, individual can misjudge her ideas, for example when one underestimates the capital costs or overestimates the market demand. The entrepreneur communicates the most with others during the start-up phase of a company. And at this point entrepreneurial colleagues can play a crucial role as they can provide different perspectives, relevant knowledge and other forms of support. The entrepreneur can save resources as money and time by referring to own network instead of searching for information independently. In

addition, entrepreneurs can play a role of a broker by introducing two business owners what can lead to collaborations and increase the sales profit for both entrepreneurs and chances for success (Greve and Salaff 2003).

Allen's research on social networks and self-employment was based on adults from Wisconsin, USA. It was found that having a network of entrepreneurs and self-employed family members is positively correlated with opportunity entrepreneurship. And, most important, the quality of knowledge provided by the entrepreneur was found more important than the size of the network (Allen 2000). Some years later researchers Minniti and Arenius did research on entrepreneurship in 28 countries based on the GEM dataset. It was found that having a network of entrepreneurs was positively related to necessity entrepreneurship. Researchers suggested that having a role model as a business owner and being a part of a network can reduce ambiguity (Minniti and Arenius 2005). Similar research was made by Autio and Acs (2007) again based on GEM dataset. The sample consisted of 500,000 interviews over a period of 6 years. As a result it was shown that having a network of entrepreneurs increases the chances that an individual becomes self-employed and is associated with business growth (Autio and Acs 2007).

However, some studies revealed modest participation of females in social networks.

Godwin, Stevens and Brenner state in their research that taking into account predominance of men in leadership and strategic roles, they are likely to have access to resources outside women entrepreneurs' typical sphere of influence. Thus, partnering with a male may bring not only access to more information but also access to the physical and financial resources necessary to grow and succeed. Consequently, adding a man to the ownership structure may allow a woman entrepreneur to choose the mediator for these transactions, rather than relying on her ability to negotiate a male-dominated landscape, the author states (Godwin et al. 2006). Langowitz and Minniti studied the entrepreneurial inclination of females in 17 countries and found a positive relationship between having a network and the entrepreneurial inclination of women. They claimed that when considering becoming self-employed, having a network of other entrepreneurs is one of the most important variables (Langowitz and Minniti 2007).

On the other hand, it has been identified that women have a small social network, because they lack communication skills and do not participate in network events. This can be an explanation why fewer women are self-employed compared to men. Interestingly, female's network mainly consists of family members. Self-employed family members can become providers of information and resources (for example, finance) and they are more likely to provide a loan than a bank. Their support can be very important for exploring business opportunities (Renzulli et al. 2000). Based on the discussion above it can be said that obtaining a

network of entrepreneurs can facilitate women to become entrepreneurs. Summary of main ideas discussed in overviewed researches is presented in the Table 3.

Table 3 Summary of early research review on female entrepreneurship after 2000s

	Topics discussed	Literature source
National approval	Patterns of managerial behavior of female entrepreneurs from national characteristics' perspectives	Pathak 2013 Hechavarría et al. 2015 Surangi 2017
Psychological profile	Their profile was supposed to be characterized by such features as sensitivity, teamworking ability and even intuition. These features were theoretically and empirically demonstrated in researchers' works	Walker and Webster 2006 Cook, Belliveau and Lentz 2007 Cantzler and Leijon 2007
Motivation	The share of female entrepreneurs is higher in countries with low income per capita, explained as a necessity to earn leaving	Malach Pines et al 2010 Diegues-Castrillon et al. 2012 Reichborn-Kjennerud 2014 Saridakis et al 2014
Finance	Some researchers stated that actually there was no discrimination in a process of obtaining a credit Other researchers, on opposite, found signs of discrimination	Orser, Riding and Manley 2006 Wilson et al. 2007 Carter et al. 2007 Harrison and Mason 2007 Gicheva and Link 2015 Stošic Panić 2017
Governmental policies	No common view, some researchers consider policies insufficient, others report the positive outcomes of programs focused on the empowerment of female entrepreneurs	Natividade 2009 Nieman and Vuuren 2006 Lerner, Menahem and Hisrich 2005 Orser and Elliott 2015 Henry et al. 2017
Training and education	Research suggested that women were less prepared for business ownership than men in the area of human capital. Typically, women were less likely to be educated in the business disciplines	Wilson et al. 2007 Handy et al. 2007 Coleman S. 2007 Seuneke and Bock 2015 Tegtmeier and Mitra 2015 Bianchi et al 2016

Networking	Quality of knowledge provided by the entrepreneur was found more important than the size of the network Having a network of entrepreneurs was positively related to necessity entrepreneurship in some researches and positive relationship between having a network and the entrepreneurial inclination of women in other researches	Allen 2000 Minniti and Arenius 2005 Autio and Acs 2007 Langowitz and Minniti 2007 Pathak 2013
Types of business ran	More needs to be done to encourage women venturers to develop technology-based enterprises	Hampton, McGowan and Cooper 2011

1.2.4. Female entrepreneurship in innovative-driven countries

In accordance with World Economic Forum (WEF) classification of countries in Global Competitiveness Report, innovation-driven economies are the most developed. In this phase, businesses are more knowledge-intensive and oriented on service sector (Economic Development Level 2017).

However, with regard to academic research on innovative-driven (developed) countries there is a scarce number of papers. Although, policy implications or another supportive measures for female entrepreneurs by research centers or private companies are taken mostly within developed countries.

Even in the developed countries, where women often are more highly educated than men, women are less likely to think that they can be successful in starting a new innovation-driven business. In addition, the female entrepreneurs appear to show reluctance to expand their businesses or to enter new and less tested markets. Fewer women than men start a new business and run established business due to individual, social, cultural and institutional factors. The individual factors that limit entrepreneurial success includes lack of education and training, self-doubt, fear of failure and a desire to seek approval from others (Bruin et al. 2006). In developed economies, women may be more educated than males but it may not be connected to self-perception and confidence in their entrepreneurial activities. The social and cultural factors that inhibit female entrepreneurship contain male-dominated social structure that leads to household and childcare responsibilities delegated mostly to women (Brush et al. 2012). Researches state that norms that are related to marriage as well have impact on female entrepreneurship: more

people especially females in developed countries live alone and some consider that this situation forces them to take part in entrepreneurship (Ascher 2012).

In addition, research in developed countries shows that there are still barriers existing to get external finance for female entrepreneurs, at the same time, impediments are diminishing because financial institutions in developed countries become more attentive to gender issues and begin to refer to women entrepreneurs as to a mean og generating profit for them (Kay, Gunterberg, Holz and Wolter 2003).

In 2016 for Women's Business Council in the UK, an independent working group set up by Deloitte to advise on how to optimize contribution of women to economic growth, a research on female entrepreneurship was run and a report published on reasons that are supposed to be barriers. It was made based on interviews of successful female entrepreneurs from around the UK. It was found that only 5.7% of working-age women were engaged in early stage entrepreneurial activity in 2014, compared to more than 10% of working-age men and longevity rates of women's businesses were lower than those set up by men. At the same time researchers estimated that in case women increase their participation in entrepreneurship to men's level of 10%, overall economic contribution of women-led SMEs to more than £180bn by 2025 (Deloitte 2016).

They have identified that women obtain a lower level of self-confidence and risk disposition in comparison with male entrepreneurs; female self-perception of scarce knowledge of key business functions; and limited access to quality mentors and professional networks. Women in interviews ran by Deloitte mentioned that opportunities for building and operating professional networks were limited and they were in need of assistance to get best out of the networks. The recommendations of company included introduction of digital platform as a quality resource of potential mentors, role models and network of contacts as well as creation of programme on base of Women's Business Council to offer development opportunities for most talented female entrepreneurs and establish partnerships with various stakeholders as support from government, leading businesses, business schools and other entrepreneurial networks. Moreover, with regard to a barrier of limited uptake especially in the 18-34 age group, the researchers stated that objectives should be to encourage more young female entrepreneurs and provide them with greater support and relevant role models; and for women with families establishing collaborative networks can help to identify creative ways of combining affordable and quality care for children and other family members with demands of managing a growing business (Deloitte 2016).

Just until recently, datasets on female entrepreneurship within developed countries were mainly for the USA, still, within previous several years GEM has introduced new sets of

information for a large group of developed countries and countries with middle income (Acs, Bardasi, Estrin and Svejnar 2011).

The latest Global Entrepreneurship Monitor (GEM) report on female entrepreneurship prepared by Babson college was done based on years 2016 and 2017 and came up with conclusions regarding female entrepreneurship development in countries analyzed in report. It is stated that overall female total entrepreneurial activity (TEA) increased by 10 % and gender gap narrowed by 5% (rate of females to males who participate in entrepreneurship). The study mentions progress in opportunity perceptions around 10 % within Europe, North America and Asia. There is also stated progress in females ownership of established business: across 63 countries analyzed in the study rates of established business increased on average by 8%. Another contribution for narrowing the gender gap are rising entrepreneurial intentions. Another area to mention is likelihood of innovativeness and role of women as investors. However, there definitely remains space for challenges. While opportunity motives remain dominant for women and men entrepreneurs, females are more than 20% likely to state necessity reasons than males. Despite some positive changes in female entrepreneurial investors, there is still a significant gap in females' investors' role worldwide. Moreover, the report depicts the paradox of lower start-up rates in more educated economies is important to consider. It may well be that general education is less relevant for building entrepreneurial competencies or for developing confidence in entrepreneurial activities among women. Instead, specific entrepreneurial skills or programming, such as women-only accelerators or programs may be more relevant for inspiring confidence. It is also stated in the report that women have lower growth expectations and higher rates of discontinuance. It can mean that women face challenges in sustaining their businesses. Recent research depicted a significant disparity in women's access to financing, especially growth capital. To this end, programs, training, and coaching—including capital and access to other resources—are important to help new and established businesses persist and grow over time. However, training women entrepreneurs needs to be supplemented with demand-side programming (GEM 2017).

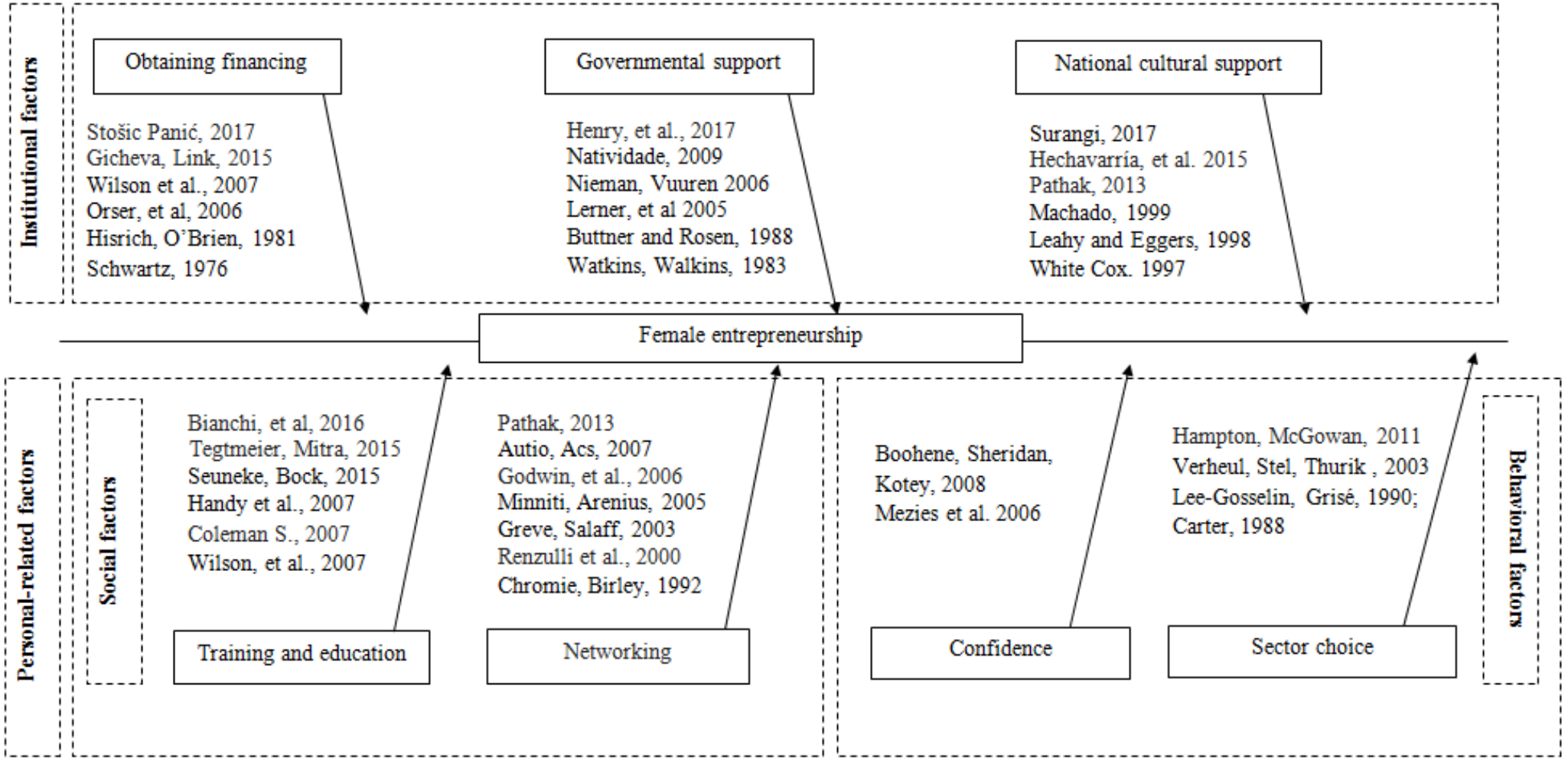
1.2.5. Summary of female entrepreneurship factors' theoretical overview

Theoretical analysis showed that first mention of differences in female and male entrepreneurship in academic studies was in 1970s. Before, researchers did not raise the question of gender differences and 1970s were scarce for studies. 1970s and 1980s covered mostly quantitative and empirical methods of research in Europe or the USA, which aim was to get understanding of female entrepreneur profile. These were the first trials to introduce concerns on female entrepreneurship and such issues as gender stereotypes and individual characteristics that contributed to differences between male and female entrepreneurship were mentioned.

In 1990s there was a surge of researches and they expanded geographically, for example, to Asia and South America. Researches of 1990s were characterized by a new wave of studying from societal point of view meaning they attributed differences between men and women to the way they were trained, brought up and educated in society. Thus, a more important role was devoted to social construction and factors rather than natural characteristics of performance and decisions of female entrepreneurs. At the same time, a number of researches raised a topic of stereotypes and brought specific females characteristics.

Researches on female entrepreneurship after 1990s experienced a significant surge, most widely discussed topics included females' competences, behavior, opening new business, access to finance, motivation for opening new business. In addition, thematic areas covered training and specific education, public policy, social identity, company's success factors. In 2000s there also appeared organizations and associations like GEM or Women Councils and Indices that aimed at measuring female entrepreneurship nationally or internationally in order to create recommendations for development of female entrepreneurship.

Based on the conducted analysis of research, main factors influencing female entrepreneurship differently from men were generalized in a diagram to present holistic view on what research was done, and which factors it primarily undermined (Picture 1).



Picture 1 Researches summary of factors influencing female entrepreneurship

1.3. Factors influencing female entrepreneurship

1.3.1. Research gap, problem and questions

Despite this growing interest, and despite the fact that the number of women entrepreneurs has accelerated radically in recent years women's entrepreneurship potential has only started to materialize. After analysis of a wide range of empirical research on gender differences among female and male entrepreneurs, it can be stated that most researches done verify existing differences of female entrepreneurship from male, however, there is no common ground on what are factors that make female entrepreneurship differ, thus, no integration of factors was described in studied works. Additionally, there is no evidence that all the above-mentioned factors have the same results across different countries what identifies the research gap. Moreover, there is sufficient amount of academic research on female entrepreneurship in developing countries. We have seen that researches were mostly done based on national research or for developing countries. However, developed countries are mentioned in researches form time to time. However, developed countries are usually not the object of research. Though, most of policies undertaken for improvement and facilitation of female entrepreneurship take place in developed countries. Thus, I would like to test my hypotheses on developed countries to understand which factors are significant for female entrepreneurs there.

Precisely, differences may exist within female entrepreneurs' institutional level- and personal-related level factors that influence their activity and business performance. Individual level determinants include psychological factor as confidence, education, networking and entrepreneurial behavior as sector choice etc. and under institutional factors governmental support, cultural approval, access to finance, etc. are understood.

Thus, the research problem is that though differences between female and male entrepreneurs are widely recognized and researched, determinants of female entrepreneurship are not so clearly defined; and there was no integrative study on factors of female entrepreneurship activity for developed countries. At the same time, there exists lack of measurements to monitor in order to make cross-country comparisons, best practices and assess policy measures. In other words, there is no framework that can define the list of factors important for female entrepreneurship. Furthermore, all researches stated above do not consider different stages of running business for studying female entrepreneurship. Despite the growing number of female-led companies globally, male-owned companies continue to demonstrate better performance than female-owned firms. The research goal is to evaluate factors that influence female entrepreneurship on different stages of business in developed countries.
The research questions to be solved are 1) to create a classification of determinants influencing

female entrepreneurial activity; 2) identify how the revealed determinants influence female entrepreneurial activity at different stages of running business in developed countries.

Understanding the differences and commonalities across individuals and across countries is an important way to understanding female entrepreneurship, and provide recommendations on how female entrepreneurship can be developed with help of policies. Analysis of factors will contribute to determining which measures exactly should be taken; what they should be aimed at. Governmental policies, professional association networks, educational institutions can further use the results to spur female entrepreneurship. The growing number of initiatives aimed at promoting entrepreneurship, and particularly at empowering women in the process, should take such differences and commonalities into account.

1.3.2. Hypotheses statement

Summarizing all the theoretical research done we can take the factors derived from literature review and thus, get the set of factors that influence female entrepreneurship activity. All the factors mentioned in researches can be segmented into institutional and personal-related. Institutional block contains the following factors: obtaining finance, governmental support and cultural support. With regard to personal-related factors 2 main blocks are identified: social and behavioural factors. Social factors include getting training and education and networking. Behavioural factors include confidence in decision of running business and sector choice (or type of business ran) (Table 4).

Table 4 Set of factors influencing female entrepreneurship activity

Institutional factors	**Personal-related factors**
Obtaining finance Governmental support Cultural support	**Social factors:** Training and education Networking
	Behavioral factors: Confidence Sector choice

For this research I would like to assess these factors by running a quantitative analysis on developed countries. Thus, in order to understand whether the chosen factors influence female entrepreneurship within developed countries I state hypotheses based on the derived framework. The hypotheses will reflect the differences for females on different stages of entrepreneurship.

Hypothesis 1: Obtaining finance

Lack of financial capital has a negative influence on female entrepreneurs.

As it is stated in the above research getting finance is one of the major issues for female entrepreneurs. There has been prejudice about women being able to successfully run business in comparison to men since late 1970s which resulted to lower share of approved bank loans (Schwartz 1976), hurdles of obtaining financing were in getting guarantees (Hisrich and O'Brien 1981). Lower access to credit for women was even justified by race (Dolinsky et al 1994). Signs of discrimination were found within getting bank loans by Carter et al.: particular evaluating criteria for loan applications had different emphasis depending on gender of bank loan officers (Carter et al. 2007). At the same time, other researchers in their works revealed that women received less funding because of reluctance of women to seek reluctance of women to seek for foreign capital. Venture capital access was also considered and stated that women obtained less venture capital as they rarely looked for such kind of financing (Harrison and Mason 2007).

In order to assess the factor of obtaining finance, lack of finance will be taken for hypothesis testing. As in researches it was predominantly stated that getting finance was much harder for female entrepreneurs, hypothesis states the negative influence of lack of finance for researched group.

Hypothesis 2: Governmental support

Governmental support has a positive influence on female entrepreneurs.

Government attention to women's entrepreneurship has increased in the past two decades; however, there are few cross-cultural studies to inform policy development. Monitoring agencies show that integration of women's issues with mainstream policy is weak. Female-focused initiatives remain selective. In general, women-oriented initiatives remain a tertiary policy consideration. Females in business taskforces also report that political and program support is limited (Orser Elliot 2015). With regard to researches reviewing influence of governmental programs on female entrepreneurship several works mentioned positive influence of specific programs: Nieman and Vuuren (2006) stated the positive notion of Women Entrepreneurship policy in South Africa, and Lerner, Menahem and Hisrich (2005) – of a governmental program in Israel.

Although the conducted research reveals controversial influence on female entrepreneurship, there are some researches that state positive influence of governmental programmes. In addition taking into account the aim of governmental programmes, which is to support entrepreneurial levels and some academic evidence, the hypotheses states a positive impact on female entrepreneurship.

Hypothesis 3: Cultural support

Cultural support of entrepreneurship activity has a positive influence on female entrepreneurs.

Within the research the topic of national approval and stereotypes in society has been covered several times. It is usually stated that females are not considered for entrepreneurial activity by society. Or vice versa, the societal support is considered to be a motivating factor for females. For example, Watkins and Watkins' research in the UK revealed that differences between male and female characteristics were of social character. Precisely, thanks to external factors and conscious intentions women were considered to be eager to work in business area accepted by society of women's presence, i.e. stereotypically women's spheres (Watkins and Walkins 1983). National context of culture is also highlighted by Pathak et al (Pathak et al. 2013), who states that nations with a higher prevalence of women's participation in economic activities and social approval instill in them the confidence of having certain levels of enactment in entrepreneurship. Thus, I conclude that national support should have a positive influence at female entrepreneurial activity.

Hypothesis 4: Training and education

Required knowledge or skills to start business has a positive influence on female entrepreneurs.

As stated in a lot of resources, researches see specific business knowledge and skills as a crucial factor for entrepreneurial activity. In research of Handy (Handy et al. 2007) a positive relationship between schooling and female entrepreneurship was found, on Indian sample. Similarly, for the USA, less women preparation for business ownership than men was considered the reason of female entrepreneurs underperformance compared to men. Educational levels were also significant in one of the profitability models for women (Coleman S. 2007). The capacity for learning is considered as a factor that improved practices in women's business ventures (Seuneke and Bock 2015). At the same time, active tutoring and the creation of collaborative processes in universities that stimulate self-confidence are important for realizing the potential of women (Bianchi 2016).

Hypothesis 5: Networking

Networking has a positive influence on female entrepreneurs.

Substantial discrepancies between social networks made of women and men separately were identified (Aldrich, Reese and Dubini 1989). Females were supposed to be not that active as men in interpersonal communication, thus, networks they developed were less dense

(Chromie and Birley 1992). Researchers noted positive relationship of networking with both necessity-based entrepreneurship (Minniti and Arenius 2005) and opportunity-based entrepreneurship (Allen, 2000). However, despite revealed modest participation of females in social networks, Langowitz and Minniti found a positive relationship between having a network and the entrepreneurial inclination of women (Langowitz and Minniti 2007). As referred to in theoretical research networking is a factor that offers more access to resources. Thus, I will test that networking should have a positive influence on female entrepreneurial activity.

Hypothesis 6: Confidence

Lack of confidence has a negative influence on female entrepreneurs.

It is stated in the literature that women are more risk-averse and it influences their decision and running business negatively. In general, female entrepreneurs are less willing to take risk and are more conservative in selecting growth strategies and therefore, they are probably less confident in their own capabilities to become an entrepreneur (Hisrich and O'Brien 1987). Negative influence on female entrepreneurship due to lack of readiness to take risks and confidence was mentioned in several researches (Boohene, Sheridan and Kotey 2008; Mezies et al. 2006).

Hypothesis 7: Sector choice (1)

Technological sector share has no influence on female entrepreneurs.

Hypothesis 8: Sector choice (2)

Consumer oriented services sector has a positive influence on female entrepreneurs.

Results of the researches revealed that types of business obtained plays an important role for female entrepreneurs (Hisrich and O'Brien 1981). Furthermore, based on the literature review, many researchers consider female-led businesses to be less likely to be engaged in technology development and high-technology sector. With regard to the type of business run by female implications of Hampton research for policy suggests that more needs to be done to encourage women venturers to develop technology-based enterprises both in Northern Ireland and further afield (Hampton 2011). Work of Lee-Gosselin and Grisé (1990) identified that females opt for small and stable business models. They further state that female-led businesses are mostly represented in services and retail sectors of economy. In this sector of economy, low entry barriers and low start-up capital favour conditions for new business venture start-up. Businesses in service sector of economy are typically described as small sized companies. Hence, as females are mostly represented in service and retail sectors, this industry could be

considered as a more influencing factor on female entrepreneurship than on their male counterparts.

Summary of all hypotheses with regard to the framework of factors derived from theoretical review is presented in the following table (Table 5).

Table 5 Hypotheses on female entrepreneurship factors based on theoretical classification

Block	Factors	Hypotheses
Institutional factors	Obtaining finance	Lack of financial capital has a negative influence on female entrepreneurs.
	Governmental support	Governmental support has a positive influence on female entrepreneurs.
	Cultural approval	Cultural support of entrepreneurship activity has a positive influence on female entrepreneurs.
Personal-related factors	**Socio-demographic factors**	
	Training and education	Required knowledge or skills to start business has a positive influence on female entrepreneurs.
	Networking	Networking has a positive influence on female entrepreneurs.
	Behavioral factors	
	Confidence	Lack of confidence has a negative influence on female entrepreneurs.
	Sector choice	Technological sector share has a no influence on female entrepreneurial activity.
		Consumer oriented services sector has a positive influence on female entrepreneurs.

2. Determining and evaluation of factors influencing female entrepreneurship

2.1. Research methodology

Having conducted analysis of researches on determinants of female entrepreneurship, I will identify whether the defined factors influence female entrepreneurship in comparison with male and if there any existing differences on several stages of company existence (start-up / new business or established business).

The current study's main purpose is exploratory. An exploratory study is aimed to find out "what is happening; to seek new insights; to ask questions and to assess phenomena in a new light" (Robson 2002). There is no single unified and widely accepted strategy to be used by every scholar. Each research strategy has both advantages and disadvantages, which makes it more or less applicable depending on the research goal, the questions, and data availability and time limitations. Within research methodology a research strategy is the way the researcher achieves the main goal of the study and answers a key question (Saunders et al. 2009). Research strategy has seven types:

1. experiments,
2. surveys,
3. case studies,
4. ethnography,
5. grounded theory,
6. action research and
7. archival research.

For the purpose of this research a mix of strategies is used. For determining factors and making a framework grounded theory strategy is followed, and for checking the evidence I refer to the survey approach, however, in order to make the analysis needed, I refer to the survey which was already run by experts in different countries. This source helps me to decrease bias which can be a disadvantage of self run survey such as an unrepresentative population, small population and especially, access to a high number of entrepreneurs for survey. Thus, in order to achieve this goal I will apply exploratory qualitative cross-national study. As the main source of empirical data for the research, Global Entrepreneurship Monitor (GEM) data will be used.

Source of data

The Global Entrepreneurship Monitor is the world's biggest study on entrepreneurship. It is used as a source of information on entrepreneurship by such significant international organizations as the United Nations, Organization for Economic Co-operation and Development, World Bank and others. It gathers regular annual datasets, and publishes reports with analysis of this data. When GEM analyzes different economies it searches for 2 components: entrepreneurial attitudes and behavioural patterns of individuals (APS) and national environment of countries and how it influences entrepreneurship (NES). GEM started its activity in 1999 as a joint project of Babson College and London Business School and the next 18 years has provided information on subject connected with entrepreneurship. The advantages of using this source are the following: it collects primary data; its approach is the same globally what allows to run detailed international comparisons; within its methodology entrepreneurship is considered to be a process meaning that it gets information from different stages from identifying opportunity for entrepreneurship to scaling a business; it obtains comprehensive global dataset and what is important for analysis of developing economies is able to track information that sometimes national official statistics do not capture (GEM 2017).

Precisely, I will refer to Adult Population Survey and National Experts Survey conducted by GEM. Adult Population Survey traces attitudes, activities and aspirations of entrepreneurs, and the focus is not only on business characteristics, but on motivation to start and operate business. For my analysis I will need Global data on national level, for each of the countries analyzed GEM administers representative national sample of minimum 2000 adults. GEM has a consistent quality of sampling methodology in various national teams gathering information. To help teams GEM provides special guidelines to ensure that there is no bias, though survey design may differ in various teams: one important aspect that can vary is contact method ranging from face-to-face, fixed-line or mobile phone sampling or combinations of these methods. For constructing the model and running the analysis I will use National level data for all countries, which includes a merged APS index weighted for population aged between 18 and 64 years. National level data includes country rates of most indicators in individual levels.

The National Experts Survey collects data on the context in which entrepreneurship takes place in a country. It provides information about the nine aspects of a country's socio-economic milieu that are believed to have a significant impact on national entrepreneurship - the Entrepreneurship Framework Conditions (EFCs). These are: Financing For Entrepreneurs, Governmental Policies, Governmental Programs, Entrepreneurial Education And Training, R&D Transfer, Commercial And Professional Infrastructure, Internal Market Openness, Physical And Services Infrastructure, Social And Cultural Norms. The information is gathered by expert

surveys and are presented in form of categorical variables. Most of the items are coded from 1= completely false to 9 = completely true on the Likert scale. Summary variables are principal components which summarize information for each block of items in the questionnaire.

Dataset

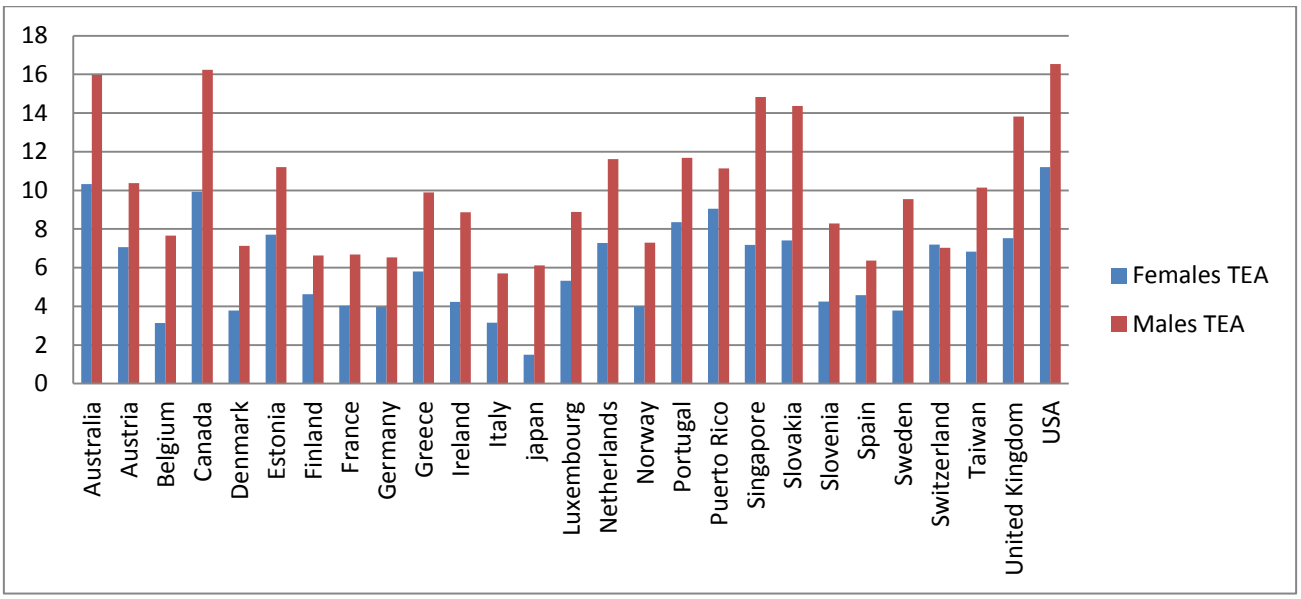
For the research I would refer only to innovation-driven countries which are developed countries. As stated in literature review there is a scarce number of academic research on female entrepreneurship in developed countries. For example, developed countries are ahead of developing in economic terms, thus, implement various measures for support of entrepreneurship together with having more favorable conditions for entrepreneurship. Due to the fact that developed countries introduce special measures to support female entrepreneurs, it would be useful to see which factors are significant for level of female entrepreneurship.

In GEM study classification of economies by economic development is based on phases defined by the World Economic Forum (WEF) in their Global Competitiveness Report. In accordance with WEF's classification, innovation-driven economies are the most developed. In this phase, businesses are more knowledge-intensive and the service sector expands (GEM 2017).

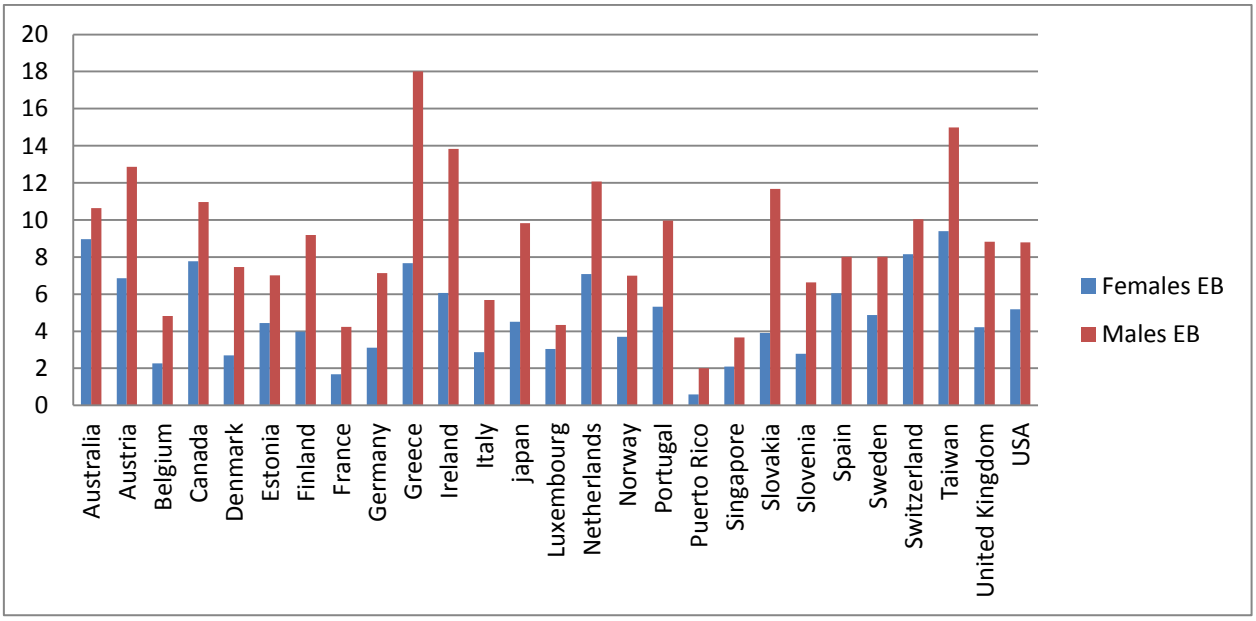
Table 6 Innovative-driven countries analyzed in the paper

Innovative-driven countries						N observations = 119
Australia	Denmark	Greece	Korea S.	Puerto Rico	Sweden	
Austria	Estonia	Ireland	Luxembourg	Singapore	Switzerland	
Belgium	Finland	Israel	Netherlands	Slovakia	Taiwan	
Canada	France	Italy	Norway	Slovenia	United Kingdom	
Cyprus	Germany	Japan	Portugal	Spain	USA	
Years 2011 – 2017 with gaps						

If we compare levels of TEA and EB by gender in different developed countries respectively, we will see that in each and every country the level of female entrepreneurship is lower than male entrepreneurship. The graphs are taken for year 2014 for the only reason, that in this year most of the reviewed countries in this research have measurements of dependent variables (Picture 2,3).



Picture 2 Females and males levels of total entrepreneurial activity, % of population aged 18-64, 2014



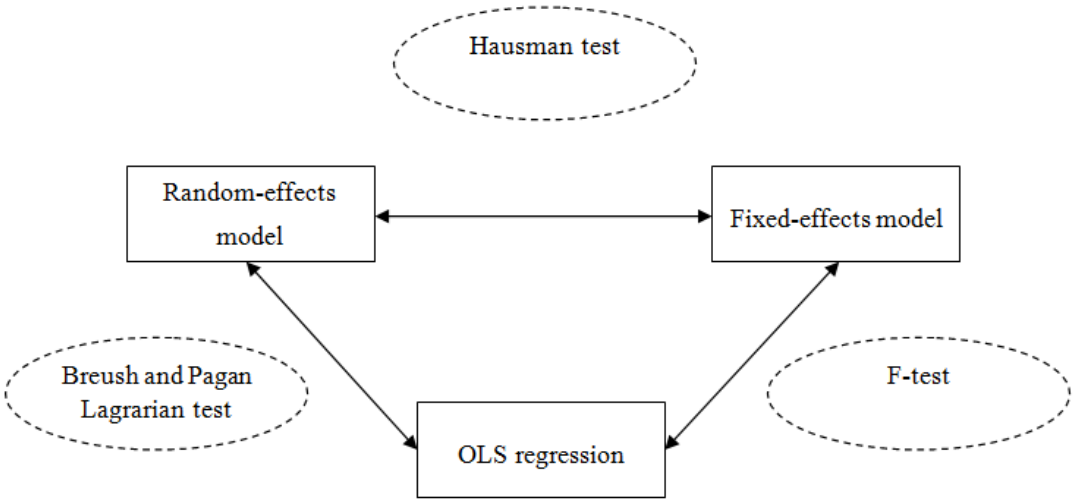
Picture 3 Females and males levels of established business activity, % of population aged 18-64, 2014

For analysis I will refer to years 2011-2017 by creating a panel dataset on the list of countries taken into analysis in current research (Table 6). Number of observations in the dataset is 119 as GEM, unfortunately, does not provide evidence on some variables to be measured for particular years. Thus, in order to assess the defined factors I have to work with the existing number of observations, which can be considered as a limitation of the model.

To check the stated hypotheses I will run three multiple regressions for each stage of running business for females: between OLS, Random-effects model or Fixed-effects model by

running statistical tests in STATA software as SPSS IBM does not have enough functions for panel data analysis (STATA 2017). To do this, dependent and independent variables will be chosen from GEM dataset best describing the defined factors for analysis and validation of hypotheses. Names of variables and descriptions will be provided later in text. Next, I will need to choose the right model for each dependent variable, which will be done with help of statistical analyses:

1) Breusch and Pagan Lagrarian test helps to choose between OLS and random-effects model;
2) F-test helps to choose between OLS and fixed-effects model;
3) Hausman test helps to choose between random- and fixed-models (Picture 4).



Picture 4 Methodology of analysis

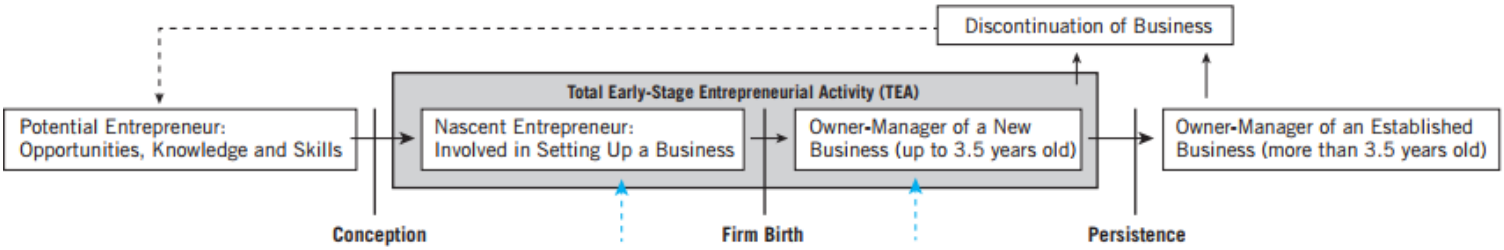
2.2 Research design

In order to test the defined hypotheses that were based on factors derived from theoretical review, firstly, it is needed to identify the variables used to measure the factors. As we have already mentioned, the variables were taken from the Global Entrepreneurship Monitor from APS and NES surveys.

1) Dependent variables

As the goal of the research is to identify determinants of female entrepreneurship and assess them at different stages of running business, the following variables will be used as dependent ones with accordance to GEM segmentation of entrepreneurship by stages (Picture 5):

1) Total Entrepreneurial Activity (TEA) – stays for those who are involved in setting up a business or are owner-managers of a new business which is less than 3.5 years old;
2) Established business (EB) – those who are owner-managers of an established business are those who run it for more than 3.5 years.



Picture 5 Stages of entrepreneurship according to GEM methodology

[Retrieved from: GEM (2017), GEM [online] Gemconsortium.org. Available at: http://www.gemconsortium.org/about/gem]

Table 7 Dependent variables measuring female and male entrepreneurial activity at several stages

Stage of entrepreneurial activity	**Dependent variables name**	**Dependent variables description**	**Dependent variables source**
1 stage - Total Entrepreneurial Activity (TEA)	TEA16fem	Share of females in age group of 18 to 64 involved in starting a new business or managing a business less than 3.5 years (in percent)	Adult Population Survey
2 stage- Established Business (EB)	EB_16fem	Share of females in age group of 18 to 64 being owner-manager of established business (more than 3.5 years) (in percent)	Adult Population Survey

2) Independent variables

Table 8 Independent variables chosen for factors measurement

Block	Factors	Independent variables description	Independent variables name	Independent variables source
Institutional factors	Obtaining finance	Share of adults in age group of 18 to 64 years who finished their entrepreneurial activity due to the problems getting finance (in percent)	EX16_RS3	Adult Population Survey
	Governmental support	Governmental programs supporting new and growing business firms (average value of summarized block of variables on governmental programs) * For detailed description of variable – see Appendix 2	NES17CSUM_MEAN9	National Experts Survey
	Cultural approval	National culture supports entrepreneurship and self-sufficiency (average value of summarized block of variables on national culture) * For detailed description of variable – see Appendix 2	NES17ISUM_MEAN9	National Experts Survey
Personal-related factors	**Socio-demographic factors**			
	Training and education	Share of females in age group of 18 to 64 who has required knowledge/skills to start business (in percent)	Suskl16f	Adult Population Survey
	Networking	Share of females in age group of 18 to 64 who knows someone who started business in past 2 years (in percent)	Knoen16f	Adult Population Survey

	Behavioral factors			
	Confidence	Share of females in age group of 18 to 64 for whom fear of failure would prevent starting a business (in percent)	Ffail16f	Adult Population Survey
	Sector choice	Share of adults involved in starting a new business or managing a business less than 3.5 years in age group of 18 to 64 who are active in technology sectors (in percent)	TEA16tec	Adult Population Survey
		Share of adults involved in starting a new business or managing a business less than 3.5 years in age group of 18 to 64 who are active in consumer oriented services (in percent)	Tea16s4p	Adult Population Survey

2.3 Data analysis

Going back to methodology of analysis in order to find out significance of particular factors it is needed to choose the right regression model. As far as we have to look at female entrepreneurship at two stages of running business, in total it is necessary to get two models for female entrepreneurs. In order to identify each of these models, 3 regressions types should be run and only one chosen for analysis based on stated statistical tests (Picture 2).

1) Females total entrepreneurial activity

After running OLS, random-effects, fixed-effects models and performing tests, the random-effects model was statistically shown to be the appropriate one (Appendix 3). Results of the random-effects model are presented in Table 9.

Table 9 Output results explaining female total entrepreneurial activity model

Factor	Variables	Beta value	z value
Obtaining finance	EX16_RS3	0.0109	0.38
Confidence	Ffail16f	-0.0341	-1.13
Training and education	*Suskl16f*	*0.1353**	*4.39*
Networking	*Knoen16f*	*0.0572***	*1.72*
Governmental support	NES17CSUM_MEAN9	-0.3802	-1.53
Technological sector	TEA16tec	-0.0055	-0.13
Consumer oriented services	*Tea16s4p*	*0.0345***	*1.76*
Cultural support	*NES17ISUM_MEAN9*	*0.5035**	*2.12*
	R^2	0.46 Random-effects model	
	N observations	119	

* Where $p < 0.05$ marked with *, and $p<0.1$ marked with **

From Table 9 we can see that at total entrepreneurial activity level for females the following factors turned out to be significant:

- training and education – having a positive influence on dependent variable TEA;
- networking – having a positive influence on dependent variable TEA;
- consumer oriented services – having a positive influence on dependent variable TEA;
- cultural support – having a positive influence on dependent variable TEA;
- obtaining finance, confidence, governmental support, and technological sector turned out to be insignificant.

2) Females established business model

Next, we switch to next stage – Established business. After running OLS, random-effects, fixed-effects models and performing tests, the random-effects model was statistically shown to be the appropriate one (Appendix 4). Results of the random-effects model are presented in Table 10.

Table 10 Output results explaining females established business model

Factor	Variables	Beta value	z value
Obtaining finance	*EX16_RS3*	*-0.0510***	*-1.92*
Confidence	Ffail16f	0.0085	0.30
Training and education	*Suskl16f*	*0.0787**	*2.68*
Networking	Knoen16f	-0.0322	-1.03
Governmental support	NES17CSUM_MEAN9	-0.3014	-1.30
Technological sector	TEA16tec	-0.0289	-0.73
Consumer oriented services	Tea16s4p	-0.0232	-1.29
Cultural support	NES17ISUM_MEAN9	0.3005	1.36
	R^2	0.15 Random-effects model	
	N observations	119	

* Where p < 0.05 marked with *, and p<0.1 marked with **

From Table 10 we can see that at established business level for females the following factors turned out to be significant:

- lack of finance – having a negative influence on dependent variable EB;
- training and education – having a positive influence on dependent variable EB;
- networking, confidence, governmental support, and technological sector, consumer oriented services, cultural support turned out to be insignificant.

3) Summary of outputs for female entrepreneurship models

The summarized results of the run models for total entrepreneurial activity and established business are presented in the Table 11.

Table 11 Output results explaining female entrepreneurial activity models

Factors	TEA female	Factors	EB female
Obtaining finance	0.0109	*Obtaining finance*	*-0.0510***
Confidence	-0.0341	Confidence	0.0085
Training and education	*0.1353**	*Training and education*	*0.0787**

Networking	*0.0572***	Networking	-0.0322
Governmental support	-0.3802	Governmental support	-0.3014
Technological sector	-0.0055	Technological sector	-0.0289
Consumer oriented services	*0.0345***	Consumer oriented services	-0.0232
Cultural support	*0.5035**	Cultural support	0.3005
Model	Random-effects	Model	Random-effects
R2	0.46	R2	0.15
N observations	119	N observation	119

* Where $p < 0.05$ marked with *, and $p<0.1$ marked with **

Next, we go back to our hypotheses statement and see which of them turned out to be approved or rejected based on the run analysis and obtained results (Table 12).

Table 12 Approved and rejected hypotheses

Block	**Factor**	**Independent variable**	**Stage of business**	**Factor significance**	**Hypothesis**
Institutional factors	Lack of finance	Lack of financial capital has a negative influence on female entrepreneurs.	TEA	0	Rejected
			Established business	-	Approved
	Govern-mental support	Governmental support has a positive influence on female entrepreneurs.	TEA	0	Rejected
			Established business	0	Rejected
	Cultural approval	Cultural support of entrepreneurship activity has a positive influence on female entrepreneurs.	TEA	+	Approved
			Established business	0	Rejected
Personal-related	**Socio-demographic factors**				
	Training and education	Required knowledge or skills to start business has a positive influence on female entrepreneurs.	TEA	+	Approved
			Established business	+	Approved

	Networking	Networking has a positive influence on female entrepreneurs.	TEA	+	Approved
			Established business	0	Rejected
	Behavioral factors				
	Lack of confidence	Lack of confidence has a negative influence on female entrepreneurs.	TEA	0	Rejected
			Established business	0	Rejected
	Sector choice (technological sector)	Technological sector share has a no influence on female entrepreneurial activity.	TEA	0	Approved
			Established business	0	Approved
	Sector choice (consumer oriented sector)	Consumer oriented services sector has a positive influence on female entrepreneurs.	TEA	+	Approved
			Established business	0	Rejected

Acceptance or reject of the hypotheses had different results on different stages, meaning that different factors have influence on female entrepreneurship at two stages stated in analysis. On the first early stage of entrepreneurship, when a business is run less than 3.5 years results reveal that cultural approval, training and education, networking and consumer-oriented services sector are important for female entrepreneurial activity levels in innovative-driven countries. On the second reviewed stage, when a business is over 3.5 years, lack of financial capital, training and education, and consumer-oriented services sector are important. Noteworthy, that cultural approval and training and education turned out to be important at both stages. Though, governmental support and lack of confidence were significant at none stage.

2.4. Discussion of obtained results

After obtaining results on each hypothesis we can elaborate on results for each factor that we identified in the set derived from theory analysis earlier.

Obtaining finance

The hypothesis, stated in the beginning that lack of finance has a negative influence on female entrepreneurs, can be accepted only for the established business stage. However, it is rejected for total entrepreneurial activity. Probably, for total entrepreneurial activity level there exists a number of sources in order to obtain financial capital to start a business in developed countries. However, as for established business stage probably the question is more specific in terms of finding money for growth stage. The results can be interpreted the way that for established business stage the reason for exiting business is the finance but not the other ones as the variable chosen for measuring access to finance was lack of finance as exit reason. Thus, probably, due to finance reasons entrepreneurs tend to exit business more on established business stage rather than on starting business. And on starting business stage there are other impediments due to which businesses can close. Additionally, the same models were ran for male entrepreneurs for comparison (Appendix 5,6,7). It is noteworthy that for female and male entrepreneurs the results are the same at each stage, illustrating that for this factor there is apparently no gender differences in developed countries.

Governmental support

Surprisingly, the results showed that government support is insignificant for female entrepreneurship. This parameter is a summary of experts's opinions on the way government supports in form of governmental programmes assist in facilitating entrepreneurship activity. Probably, the gap that the programmes are believed to cover is not that significant for entrepreneurs in developed countries. We can also take into account that it is an aggregated measure for governmental support, and maybe in further research there is ground to test particular areas of governmental support. In addition, the variable was not assessed separately for female and male governmental support. Thus, there might be a lack of female specific programmes that take into account parameters that are specifically important for female entrepreneurship. This is supported by females in business taskforces who also report that political and program support specific for women is limited (Orser Elliot 2015).

Cultural approval

With regard to cultural approval we can say that it is truly significant factor for an early stage of a female entrepreneurial activity level. Meaning that for females social approval of entrepreneurial occupation is an important factor to start a business. Interestingly, it is not significant for those that have an established business. The variable represented an aggregated value of experts' opinions on different personal characteristics regarding entrepreneurship that are supported in society. The results go in line with literature review regarding the stereotypes in society that hinder (Watkins and Walkins 1983) or facilitate female entrepreneurship (Pathak et al. 2013). In this research cultural support was measured by variable including social positive attitude to characteristics that can be attributed to entrepreneurs, thus, this variable has a positive influence on the level of entrepreneurial activity.

Training and education

Training and education is the factor that is significant for all models: female entrepreneurs at total entrepreneurship activity level and at established business level. Training and education in developed countries are supposed to be main factors which facilitate entrepreneurial activity for both genders. This is justified by literature: the capacity for learning is considered as a factor that improved practices in women's business ventures (Seuneke and Bock 2015), active tutoring in universities is also important for realizing the potential of women (Bianchi 2016). It may be concluded that for developed countries training and education give spur for entrepreneurs for improvement and thus, should be in focus. These are great opportunities to help females to become more successful entrepreneurs by engaging them in educational activities and provide special trainings on business topics.

Networking

The hypothesis stated that networking has a positive influence on female entrepreneurs, and the results showed that this proposal is true for total entrepreneurial activity stage but not for established business one. For potential explanation we have to refer to the variable used to measure networking. The variable stated: knowing others who started business in past 2 years. This means that entrepreneur knows another entrepreneur who started business recently. This goes hand in hand with some researches' statements. The entrepreneur communicates the most with others during the start-up phase of a company, at this point entrepreneurial colleagues can play an important role as they can provide relevant knowledge and other forms of support. The

start-up entrepreneur can save resources as money and time by referring to own network instead of searching for information herself (Greve and Salaff 2003).

With regard to established business, we have an assumption that for established entrepreneurship other types of connections are more beneficial. The established entrepreneurs probably look for connections with deep market understanding, or enough expertise to help the ones who have established business. This is also mentioned in Allen's research on social networks and self-employment based on adults from USA, which showed that quality of knowledge provided by the entrepreneur was found more important than the size of the network (Allen 2000). The type of networking that may help are specialists from the industry in which entrepreneur already operates; access to human capital sources, specialized expertise. Thus, there is space left for further research in order to assess networking from more diverse and professional point of view that can bring more benefit to an entrepreneur.

Confidence

Contrary to hypothesis stated women in developed countries are not unconfident on every stage of running a business. The lack of confidence did not show any significance which is contrary to the research reviewed (Boohene, Sheridan and Kotey 2008; Mezies et al. 2006). Presumably, it may be connected with national support, however, these two factors did not show correlation.

Sector choice

Starting with technological sector, results showed that it is insignificant for established business for both levels of female entrepreneurs, showing that females still opt for stepping into technological business less than men. This is depicted in research that even in developed countries women have to be stimulated to start technology-driven business (Hampton, McGowan and Cooper 2011). This can be aligned by helping women to start technological business via specialized programmes.

As for consumer-oriented business, this sector turned out to be significant for females at total entrepreneurial activity level, but not at the established business level. And it seems that for established business level the sector does not play a great role for both genders. Thus, types of business obtained play an important role for female entrepreneurs (Hisrich and O'Brien 1981) only at total entrepreneurial level within developed countries.

Taking into account results of hypotheses testing there can be provided ground for implication of results for stimulation of female entrepreneurship.

2.5. Implications

Having considered all the results obtained from the analysis we can come up with the implications that can be derived from the research. Basing on the models' results I would like to focus on main issues identified via analysis that can bring difference to improvement of female entrepreneurship in developed countries. The main recipients of the implications are female entrepreneurs while other stakeholders included can be policy makers, business associations, incubators and other stakeholders interested in entrepreneurial development.

Cultural approval

This gives ground for considering measures that may facilitate positive attitude in society towards female entrepreneurs. For instance, this can be done by introducing the female entrepreneurs role models. Women who started their own business can be inspired by someone else who has done so. Clearly, this is an important factor in inspiring potential female entrepreneurs. The Government could successfully roll such schemes out by promoting female entrepreneurs through role-model programmes and national competitions choosing the distinctive female entrepreneurs in order to set a positive example. Successful female entrepreneurs can also help the cause by signing up to existing programmes and speaking at events in educational institutions and women's networks, while also mentoring prospective entrepreneurs themselves. Example can be Science & Technology Australia (STA), which is Australia's peak body in science and technology representing about 70,000 Australian scientists and technologists working across all scientific disciplines. STA is a respected and influential contributor to debate on public policy, providing a strong voice for those we represent. STA launched 'Superstars of STEM' which won support through the new Women in STEM and Entrepreneurship program to work with women at all career stages to create new stereotypes, and new heroes to define them (STEM 2017).

Another method is to promote entrepreneurship via education in order to form a positive attitude towards female entrepreneurship from early years. Thus, corresponding measures can be incorporated in educational plans.

Governmental support

The existing support for those who want to start a business is not gender specific, instead operating under a "one size fits all" approach. According to OSCE (the Organization for Security and Co-operation in Europe) gender specific legislation should not view gender as an isolated matter, but rather seeks to explicitly integrate a gender dimension into all programmes and

activities prescribed by the law in question, but rather a nuanced analysis of the specific conditions, needs and priorities of various social groups in society (OSCE 2017).

At the same time, to successfully mobilize female group, good quality, relevant information and support needs to be more readily available. To achieve this, the marketing of schemes also needs to be targeted towards men and women separately in order to be successful.

Training and education

Entrepreneurship needs to be promoted vigorously in an educational setting. The skills, networking opportunities and gaining of self-confidence all need to be addressed from an early age to improve the chances of enterprise being viewed as a viable option for young women. To achieve this, the government needs to research which existing schemes help to produce the highest levels of successful entrepreneurs. In business itself, women's organizations should work together with government officials to help create an industry-led approach. The business world should also aid the development of a college and school module based on starting a business to ensure that it covers all the necessary skills. Research centers can also assist in create a business model canvas to track progress on their businesses together with their initiatives under this programme include personal development and networking sessions. Universities can play a crucial role in these terms. In research of Bianchi, 2016 universities are stated to play a crucial role in several areas. The potential may be pursued at the level of teaching that promotes interdisciplinary and soft skills and that is able to convey positive model roles for women. At the same time, active tutoring and the creation of collaborative processes that stimulate self-confidence are important for realizing the potential of women (Bianchi 2016). The potential may be at the level of teaching that promotes interdisciplinary and soft skills and that is able to convey positive model roles for women. Plus, active tutoring and creation of collaborative processes that stimulate self-confidence are important for realizing the potential of women. Besides their teaching and research mission, universities could embrace more fully and promote a culture of entrepreneurship that constantly interacts with the economic and social environments in which universities operate.

Networking

Networking results in a significant factor for female entrepreneurs at starting and early business stage. This insight can be used to create networks of female entrepreneurs to create connections, for instance, by governmental programs or business network associations. For example, EU resolution of “Women and entrepreneurship” states need of UE member states to continue its full support to the European Network of Female Entrepreneurship Ambassadors

(European Commission 2008). European Commission supports several tools such as networks and an e-platform helping women become entrepreneurs and run successful businesses such as WEgate-platform: a one-stop-shop for women entrepreneurship; the European Community of Women Business Angels and women entrepreneurs; the European network to promote women's entrepreneurship (WES); the European network of female entrepreneurship ambassadors; the European Network of Mentors for Women Entrepreneurs (European Commission 2008).

Additionally, as it has been mentioned, further research is needed on networking due to limitations on measurement of networking factor – only network of other entrepreneurs was taken into account. Potentially, there is probability that in networking pool it is more beneficial to have not only other entrepreneurs, but rather professionals from related spheres and those with expertise.

Sector choice – technological sector

Regarding involvement of women in technological sphere, a set of measures can be implemented. Apart from traditional governmental programs that promote technology, technical involvement can be promoted at educational levels. One of potential ways can be involvement of women in makers movement. The Maker Movement is the do-it-yourself approach into technology which invites people to create new devices and/or adapt existing ones to new purposes. It employs new technologies such as 3-D printers, lasers, computerized machine tools, and robots, using open-source programs and materials, with a focus on practical skills and products. And it embraces an interactive community, using modern settings as incubators along with more traditional community centers, libraries, museums, and schools. A technology-inspired branch of the makers movement that promotes “learning by doing” could help cover the gender gap. For instance, California Community College Makerspaces offer to build maker communities and provide mentors in order to increase female representatives (ccmaker 2017). The report advises libraries and museums to hold informal maker places for underrepresented groups. It also encourages educators to identify trends to integrate within making activities. For females who consider becoming entrepreneurs special technical educational courses can be run on base of universities. Throughout the programs, women can be taught and coached by successful entrepreneurs and leading innovation experts from the business community. Accelerators can be set to encourage and assist women who want to become entrepreneurs.

Conclusion

The phenomenon of women's entrepreneurship is considered as a potential source of economic and social development. Interest lies largely in what these women do and do not accomplish compared to men and then takes into account questions that go along with understanding the founding, development, and growth of the businesses. The number of women starting and running new businesses is growing (GEM 2017). In addition, the World Bank shows that women entrepreneurs contribute substantially to economic growth and poverty reduction. Women entrepreneurs are more likely to contribute to their children's education, health and nutrition compared to male entrepreneurs (World Bank 2016). At the same time, if we look at entrepreneurial activity levels of both females and males, for all the countries views in GEM research male country entrepreneurial activity levels are higher than females even in developed countries (GEM 2017).

Analysis of a wide range of empirical research on gender differences among female and male entrepreneurs shows that most researches verify existing differences, still, there is no common ground on what are factors that make female entrepreneurship differ from male. Various factors are mentioned in different researches, however, there is no integration depicted in researches that could summarize the studied factors.

Thus, the research problem is that though differences between female and male entrepreneurs are widely recognized and researched, reasons for gender differences are not so clearly defined; and there is no integration that can define the list of factors important for gender differences. Moreover, researches reviewed in this work do not consider different stages of running business for female entrepreneurs. The research goal is to evaluate factors that influence female entrepreneurship on stages of early and established business for developed countries.

The first research questions was to create a classification of determinants influencing female entrepreneurial activity. The paper provides integration of factors based on an extended theoretical overview, the result of which is a classification of factors into institutional and personal-related factors. Institutional factors consist of obtaining finance, governmental support, and cultural support of entrepreneurship. While internal factors are of two groups: firstly, social ones including training and education and networking; and secondly, behavioural factors including motivation, confidence, market conditions perception and sector choice. After factors are identified from the theoretical overview, the hypotheses are stated grounded on considered research. Lack of financial capital and lack of confidence are stated to have negative influence on female entrepreneurship activity. On the contrary, governmental support, cultural support, training and education, networking and service sector share are considered to have a positive

influence. Only technological sector share is stated to have no influence on female entrepreneurial activity.

The second research goal, which is to identify how the revealed determinants influence female entrepreneurial activity at different stages of running business in developed countries, was achieved by running exploratory quantitative model in STATA on panel dataset for developed countries obtained from National experts survey and Adult population survey of GEM. As the research was done for two stages of female entrepreneurship business, there were two models run for the first early stage of entrepreneurship, when a business is run less than 3.5 years (TEA) and second reviewed stage, when a business is over 3.5 years (EB). The analysis performed showed that acceptance or reject of the hypotheses had different results on different stages, meaning that different factors have influence on female entrepreneurship at two stages stated in analysis. On the first early stage of entrepreneurship cultural approval, training and education, networking and consumer-oriented services sector are important for female entrepreneurial activity levels in innovative-driven countries. On the second reviewed stage lack of financial capital, training and education, and consumer-oriented services sector are important. Noteworthy, that cultural approval and training and education turned out to be important at both stages. Though, governmental support and lack of confidence were significant at none stage. Additionally, same statistical models were ran in work and presented in discussion. The discussion of obtained results provides the following considerations. Lack of finance was depicted on the second stage for females. At the same time, before providing any recommendations there is a need to run a more detailed research with regard to the type of finance that female entrepreneurs lack and then develop precise recommendations and support programs. Governmental support turned out to be insignificant, however, the variable was considering general support for entrepreneurship, thus, we see a need to introduce gender-specific programs and increase awareness of offered support. Cultural approval is important at first stage, which highlights importance of promoting female entrepreneurship on social level, for example, by introducing role models, and to increase awareness of female entrepreneurship issue. Training and education is important at all levels and for both female and male entrepreneurs, thus, special business education should be a main driver of support. Networking turned out to be important at early stage, showing a need of female networks to share obtained knowledge and increase access to different types of resources. Last but not least, research shows that women opt for service sector and omit technological one compared to males. This can also be improved by involving women into business technological programs and helping them to market the technological products.

Practical implications of the results can be especially useful for promoting female entrepreneurship via educational institutions, introducing female specific support programs for entrepreneurs, making entrepreneurs more aware of governmental policy measures, promoting with networking associations. Governmental policies; professional association networks, educational institutions, corporations and entrepreneurs themselves can further use the results to spur female entrepreneurship. The growing number of initiatives aimed at promoting entrepreneurship, and particularly at empowering women in the process, should take such differences and commonalities into account.

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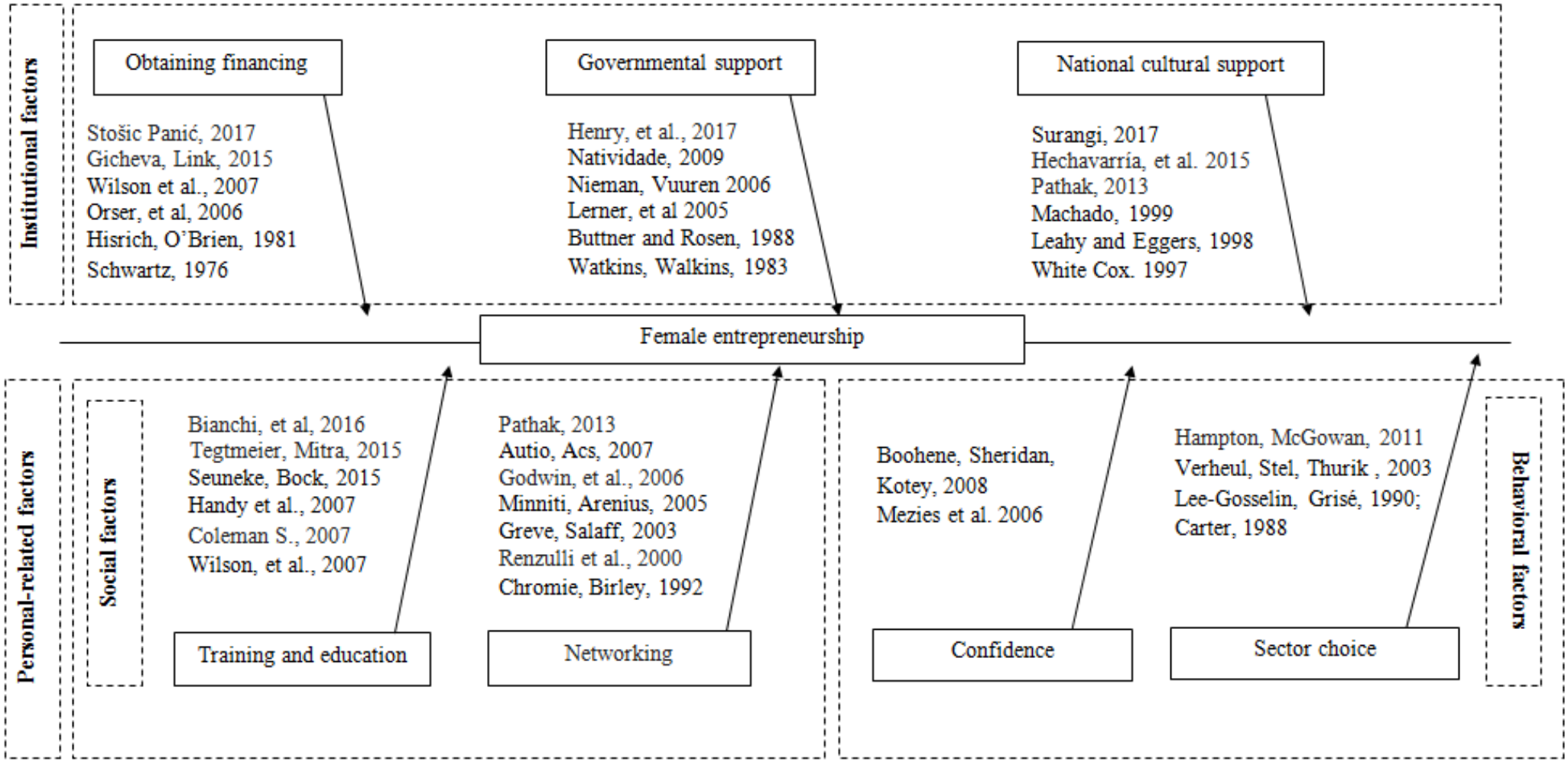
Appendix 1. Summary of theoretical research on factors influencing female entrepreneurship



Appendix 2. Governmental support and cultural support factors composition in NES GEM

Governmental programs supporting new and growing business firms (average value of summarized block of variables on governmental programs, experts grades on 9 point Likert scale)	In my country, a wide range of government assistance for new and growing firms can be obtained through contact with a single agency
	In my country, science parks and business incubators provide effective support for new and growing firms
	In my country, there are an adequate number of government programs for new and growing businesses
	In my country, the people working for government agencies are competent and effective in supporting new and growing firms
	In my country, almost anyone who needs help from a government program for a new or growing business can find what they need
	In my country, government programs aimed at supporting new and growing firms are effective
National culture supports entrepreneurship and self-sufficiency (average value of summarized block of variables on national culture, experts grades on 9 point Likert scale)	In my country, the national culture is highly supportive of individual success achieved through own personal efforts
	In my country, the national culture emphasizes self-sufficiency, autonomy, and personal initiative
	In my country, the national culture encourages entrepreneurial risk-taking
	In my country, the national culture encourages creativity and innovativeness
	In my country, the national culture emphasizes the responsibility that the individual (rather than the collective) has in managing his or her own life

Appendix 3. Stata output for female total entrepreneurial activity model

Source	SS	df	MS		
Model	455.803427	8	56.9754284	Number of obs =	119
Residual	437.327166	110	3.97570151	F(8, 110) =	14.33
				Prob > F =	0.0000
				R-squared =	0.5103
				Adj R-squared =	0.4747
Total	893.130593	118	7.56890333	Root MSE =	1.9939

TEA16fem	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
EX16_RS3	-.0181583	.0392373	-0.46	0.644	-.0959174	.0596009
Ffail16f	-.0334479	.022676	-1.48	0.143	-.0783865	.0114907
Suskl16f	.135998	.0219007	6.21	0.000	.0925959	.1794
Knoen16f	.0250129	.027576	0.91	0.366	-.0296362	.079662
NES17CSUM_MEAN9	-.5415425	.2291588	-2.36	0.020	-.9956814	-.0874036
TEA16tec	-.0462751	.0638773	-0.72	0.470	-.1728649	.0803148
Tea16s4p	.0005073	.021915	0.02	0.982	-.0429231	.0439376
NES17ISUM_MEAN9	1.054774	.2106294	5.01	0.000	.6373561	1.472192
_cons	1.007547	2.025981	0.50	0.620	-3.007473	5.022566

Picture 6 OLS model for female total entrepreneurial activity

Random-effects GLS regression		Number of obs =	119
Group variable: countrynum		Number of groups =	30
R-sq: within = 0.2889		Obs per group: min =	1
between = 0.5003		avg =	4.0
overall = 0.4639		max =	5
		Wald chi2(8) =	60.72
corr(u_i, X) = 0 (assumed)		Prob > chi2 =	0.0000

TEA16fem	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
EX16_RS3	.0109034	.0290506	0.38	0.707	-.0460346	.0678415
Ffail16f	-.0341044	.0301437	-1.13	0.258	-.093185	.0249763
Suskl16f	.1353283	.0308482	4.39	0.000	.0748669	.1957896
Knoen16f	.0572354	.0333726	1.72	0.086	-.0081737	.1226445
NES17CSUM_MEAN9	-.3802158	.2487975	-1.53	0.126	-.8678498	.1074183
TEA16tec	-.0055095	.0437782	-0.13	0.900	-.0913132	.0802942
Tea16s4p	.0345426	.0196478	1.76	0.079	-.0039663	.0730516
NES17ISUM_MEAN9	.5035098	.2379113	2.12	0.034	.0372123	.9698074
_cons	-.3990244	2.0509	-0.19	0.846	-4.418715	3.620666
sigma_u	1.7430167					
sigma_e	1.0969566					
rho	.71629465	(fraction of variance due to u_i)				

Picture 7 Random-effects model for female total entrepreneurship activity

Breusch and Pagan Lagrangian multiplier test for random effects

TEA16fem[countrynum,t] = Xb + u[countrynum] + e[countrynum,t]

Estimated results:

	Var	sd = sqrt(Var)
TEA16fem	7.568903	2.751164
e	1.203314	1.096957
u	3.038107	1.743017

Test: Var(u) = 0

chibar2(01) = 78.12

Prob > chibar2 = 0.0000

Picture 8 Breusch and Pagan Lagrarian test

Fixed-effects (within) regression — Number of obs = 119

Group variable: countrynum — Number of groups = 30

R-sq: within = 0.3001 — Obs per group: min = 1

between = 0.4383 — avg = 4.0

overall = 0.4098 — max = 5

F(8,81) = 4.34

corr(u_i, Xb) = 0.0356 — Prob > F = 0.0002

TEA16fem	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
EX16_RS3	.0147516	.0313442	0.47	0.639	-.0476135	.0771167
Ffail16f	-.0152742	.0420233	-0.36	0.717	-.0988874	.0683389
Suskl16f	.146021	.0545709	2.68	0.009	.037442	.2546
Knoen16f	.0791781	.0476939	1.66	0.101	-.0157177	.1740739
NES17CSUM_MEAN9	-.1292354	.3160108	-0.41	0.684	-.7579978	.499527
TEA16tec	-.0038023	.0470171	-0.08	0.936	-.0973517	.089747
Tea16s4p	.0354448	.0221774	1.60	0.114	-.0086811	.0795708
NES17ISUM_MEAN9	.2192373	.3028306	0.72	0.471	-.3833006	.8217753
_cons	-2.291895	2.892332	-0.79	0.430	-8.046728	3.462938
sigma_u	1.8969938					
sigma_e	1.0969566					
rho	.74940877	(fraction of variance due to u_i)				

F test that all u_i=0: F(29, 81) = 9.74 Prob > F = 0.0000

Picture 9 Fixed-effects model for female total entrepreneurship activity

	Coefficients			
	(b) femf1	(B) remf1	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
EX16_RS3	.0147516	.0109034	.0038482	.0117696
Ffail16f	-.0152742	-.0341044	.0188301	.0292799
Suskl16f	.146021	.1353283	.0106927	.0450153
Knoen16f	.0791781	.0572354	.0219427	.0340731
NES17CSUM_~9	-.1292354	-.3802158	.2509804	.1948401
TEA16tec	-.0038023	-.0055095	.0017072	.0171487
Tea16s4p	.0354448	.0345426	.0009022	.0102859
NES17ISUM_~9	.2192373	.5035098	-.2842725	.1873622

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 7.12
Prob>chi2 = 0.5239

Picture 10 Hausman test

Appendix 4. Stata output for female established business model

Source	SS	df	MS
Model	146.644051	8	18.3305063
Residual	397.311232	110	3.61192029
Total	543.955282	118	4.60979053

Number of obs = 119
F(8, 110) = 5.08
Prob > F = 0.0000
R-squared = 0.2696
Adj R-squared = 0.2165
Root MSE = 1.9005

EB_16fem	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
EX16_RS3	-.1538475	.0373991	-4.11	0.000	-.2279638	-.0797312
Ffail16f	.0674775	.0216137	3.12	0.002	.0246442	.1103109
Suskl16f	.0534437	.0208747	2.56	0.012	.012075	.0948125
Knoen16f	-.0354071	.0262841	-1.35	0.181	-.087496	.0166818
NES17CSUM_MEAN9	-.0506462	.2184231	-0.23	0.817	-.4835096	.3822172
TEA16tec	-.0842848	.0608848	-1.38	0.169	-.2049442	.0363746
Tea16s4p	-.0362843	.0208883	-1.74	0.085	-.07768	.0051115
NES17ISUM_MEAN9	.3913831	.2007619	1.95	0.054	-.0064798	.7892461
_cons	2.998883	1.931068	1.55	0.123	-.8280408	6.825808

Picture 11 OLS model for female established business

```
Random-effects GLS regression                   Number of obs      =       119
Group variable: countrynum                      Number of groups   =        30

R-sq:  within  = 0.0996                         Obs per group: min =         1
       between = 0.1695                                        avg =       4.0
       overall = 0.1511                                        max =         5

                                                Wald chi2(8)       =     14.73
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0647
```

EB_16fem	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
EX16_RS3	-.0510457	.0265232	-1.92	0.054	-.1030302	.0009389
Ffail16f	.0085288	.0283031	0.30	0.763	-.0469442	.0640018
Suskl16f	.0787245	.0293926	2.68	0.007	.021116	.1363329
Knoen16f	-.0322526	.031335	-1.03	0.303	-.093668	.0291627
NES17CSUM_MEAN9	-.3014837	.2316377	-1.30	0.193	-.7554853	.1525178
TEA16tec	-.0289586	.0399026	-0.73	0.468	-.1071663	.049249
Tea16s4p	-.0232506	.0180461	-1.29	0.198	-.0586204	.0121192
NES17ISUM_MEAN9	.3005125	.2216066	1.36	0.175	-.1338283	.7348534
_cons	4.236636	1.918864	2.21	0.027	.4757308	7.997541
sigma_u	1.7208516					
sigma_e	.99062388					
rho	.75109845	(fraction of variance due to u_i)				

Picture 12 Random-effects model for female established business

```
Breusch and Pagan Lagrangian multiplier test for random effects

        EB_16fem[countrynum,t] = Xb + u[countrynum] + e[countrynum,t]

        Estimated results:
                         |       Var     sd = sqrt(Var)
                ---------+------------------------------
                EB_16fem |   4.609791       2.147042
                       e |   .9813357       .9906239
                       u |    2.96133       1.720852

        Test:   Var(u) = 0
                                 chibar2(01) =    87.54
                              Prob > chibar2 =   0.0000
```

Picture 13 Breusch and Pagan Lagrarian test

```
Fixed-effects (within) regression               Number of obs      =       119
Group variable: countrynum                      Number of groups   =        30

R-sq:  within  = 0.1193                         Obs per group: min =         1
       between = 0.0945                                        avg =       4.0
       overall = 0.0770                                        max =         5

                                                F(8,81)            =      1.37
corr(u_i, Xb)  = -0.2682                        Prob > F           =    0.2214
```

EB_16fem	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
EX16_RS3	-.0381064	.0283059	-1.35	0.182	-.0944262	.0182134
Ffail16f	-.0251795	.0379498	-0.66	0.509	-.1006877	.0503286
Suskl16f	.1118125	.0492811	2.27	0.026	.0137585	.2098664
Knoen16f	-.0532853	.0430707	-1.24	0.220	-.1389825	.0324118
NES17CSUM_MEAN9	-.3680292	.2853785	-1.29	0.201	-.9358429	.1997846
TEA16tec	-.029641	.0424596	-0.70	0.487	-.1141222	.0548402
Tea16s4p	-.0188673	.0200276	-0.94	0.349	-.058716	.0209813
NES17ISUM_MEAN9	.3178678	.2734759	1.16	0.249	-.2262636	.8619991
_cons	5.166423	2.611966	1.98	0.051	-.0305686	10.36342
sigma_u	1.9013178					
sigma_e	.99062388					
rho	.78649651	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(29, 81) =    11.17                 Prob > F = 0.0000
```

Picture 14 Fixed-effects model for female established business

	——— Coefficients ———			
	(b) femf2	(B) remf2	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
EX16_RS3	-.0381064	-.0510457	.0129393	.0098864
Ffail16f	-.0251795	.0085288	-.0337083	.0252808
Suskl16f	.1118125	.0787245	.033088	.0395564
Knoen16f	-.0532853	-.0322526	-.0210327	.02955
NES17CSUM_~9	-.3680292	-.3014837	-.0665454	.166688
TEA16tec	-.029641	-.0289586	-.0006823	.014512
Tea16s4p	-.0188673	-.0232506	.0043833	.0086857
NES17ISUM_~9	.3178678	.3005125	.0173552	.1602486

```
                b = consistent under Ho and Ha; obtained from xtreg
     B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =        8.86
                Prob>chi2 =      0.3542
```

Picture 15 Hausman test

Appendix 5. Stata output results for male entrepreneurial activity models

Table 13 Output results explaining male entrepreneurial activity models

Variables	Total entrepreneurial activity level		Established business	
	Beta value	z value	Beta value	T value
Obtaining finance (EX16_RS3)	0.0428	1.03	*-0.0944**	-2.10
Confidence (Ffail16m)	-0.0250	-0.51	*-0.1654**	-2.27
Training and education (Suskl16m)	*0.2092**	*4.71*	*0.1910**	2.55
Networking (Knoen16m)	0.0337	0.68	0.0275	0.41
Governmental support (NES17CSUM_MEAN9)	-0.3048	-0.85	0.2056	0.46
Technological sector (TEA16tec)	*0.1194***	*1.91*	-0.0493	-0.74
Consumer oriented services (Tea16s4p)	*0.0548***	*1.86*	-0.0158	-0.46
Cultural support (NES17ISUM_MEAN9)	*0.6259***	*1.82*	-0.2294	-0.54
R^2	0.26 Random-effects model		0.86 Fixed-effects model ***	
N observations	119		119	

* Where p < 0.05 marked with *, and p<0.1 marked with **

******* - R^2 under Stata "Absorb" function for Fixed-effects model

Appendix 6. Stata output for male total entrepreneurial activity model

Source	SS	df	MS
Model	796.422596	8	99.5528244
Residual	993.411789	110	9.03101627
Total	1789.83438	118	15.168088

Number of obs = 119
F(8, 110) = 11.02
Prob > F = 0.0000
R-squared = 0.4450
Adj R-squared = 0.4046
Root MSE = 3.0052

TEA16mal	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
EX16_RS3	.0013231	.0591946	0.02	0.982	-.1159866	.1186328
Ffail16m	-.0437446	.0340478	-1.28	0.202	-.1112194	.0237302
Suskl16m	.1558697	.0309757	5.03	0.000	.0944832	.2172562
Knoen16m	.0254123	.0418931	0.61	0.545	-.05761	.1084347
NES17CSUM_MEAN9	-.9262169	.3523649	-2.63	0.010	-1.624521	-.2279123
TEA16tec	-.0144472	.0964096	-0.15	0.881	-.2055083	.1766139
Tea16s4p	-.0043098	.0339341	-0.13	0.899	-.0715591	.0629395
NES17ISUM_MEAN9	1.658929	.3193519	5.19	0.000	1.026049	2.29181
_cons	1.165585	3.339487	0.35	0.728	-5.452494	7.783664

Picture 16 OLS model for male total entrepreneurial activity

Random-effects GLS regression
Group variable: countrynum

R-sq: within = 0.3193
between = 0.3343
overall = 0.3571

corr(u_i, X) = 0 (assumed)

Number of obs = 119
Number of groups = 30

Obs per group: min = 1
avg = 4.0
max = 5

Wald chi2(8) = 51.16
Prob > chi2 = 0.0000

TEA16mal	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
EX16_RS3	.0428135	.041477	1.03	0.302	-.03848	.1241069
Ffail16m	-.0250008	.0493383	-0.51	0.612	-.1217022	.0717006
Suskl16m	.2092903	.0444022	4.71	0.000	.1222636	.296317
Knoen16m	.0337727	.049481	0.68	0.495	-.0632082	.1307537
NES17CSUM_MEAN9	-.3048788	.360759	-0.85	0.398	-1.011953	.4021958
TEA16tec	.119465	.0625718	1.91	0.056	-.0031735	.2421036
Tea16s4p	.0548426	.029473	1.86	0.063	-.0029234	.1126086
NES17ISUM_MEAN9	.6259313	.343463	1.82	0.068	-.0472437	1.299106
_cons	-4.832858	3.451775	-1.40	0.161	-11.59821	1.932498
sigma_u	2.7712529					
sigma_e	1.5269498					
rho	.76710836	(fraction of variance due to u_i)				

Picture 17 Random-effects model for male total entrepreneurship activity

```
  Breusch and Pagan Lagrangian multiplier test for random effects

          TEA16mal[countrynum,t] = Xb + u[countrynum] + e[countrynum,t]

          Estimated results:
                              |       Var      sd = sqrt(Var)
                    ----------+------------------------------
                      TEA16mal |    15.16809       3.894623
                             e |    2.331576        1.52695
                             u |    7.679843       2.771253

          Test:   Var(u) = 0
                                      chibar2(01) =     82.69
                                  Prob > chibar2 =    0.0000
```

Picture 18 Breusch and Pagan Lagrarian test

```
Fixed-effects (within) regression               Number of obs      =       119
Group variable: countrynum                      Number of groups   =        30

R-sq:  within  = 0.3469                         Obs per group: min =         1
       between = 0.2536                                        avg =       4.0
       overall = 0.2693                                        max =         5

                                                F(8,81)            =      5.38
corr(u_i, Xb)  = -0.3471                        Prob > F           =    0.0000

------------------------------------------------------------------------------
     TEA16mal |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
--------------+---------------------------------------------------------------
     EX16_RS3 |   .0589354   .0428208     1.38   0.173    -.0262646    .1441354
     Ffail16m |  -.0158252   .0695045    -0.23   0.820    -.1541172    .1224669
     Suskl16m |   .3175694   .0712932     4.45   0.000     .1757183    .4594204
     Knoen16m |   .0158804   .0636609     0.25   0.804    -.1107847    .1425455
NES17CSUM_MEAN9 |   .1310004   .4237693     0.31   0.758    -.7121676    .9741685
     TEA16tec |   .1358404   .0635476     2.14   0.036     .0094005    .2622803
     Tea16s4p |   .0699775    .032551     2.15   0.035     .0052112    .1347438
NES17ISUM_MEAN9 |   .1792707   .4079344     0.44   0.661    -.6323908    .9909323
       _cons |  -10.94508   4.600774    -2.38   0.020    -20.09918   -1.790987
------------------------------------------------------------------------------
     sigma_u |  3.4574113
     sigma_e |  1.5269498
         rho |  .83678461   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(29, 81) =    11.90                 Prob > F = 0.0000

. estimates store fem1
```

Picture 19 Fixed-effects model for male total entrepreneurship activity

	Coefficients (b) fem1	(B) rem1	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
EX16_RS3	.0589354	.0428135	.0161219	.0106434
Ffail16m	-.0158252	-.0250008	.0091756	.0489551
Suskl16m	.3175694	.2092903	.108279	.0557778
Knoen16m	.0158804	.0337727	-.0178923	.0400542
NES17CSUM_~9	.1310004	-.3048788	.4358792	.2223363
TEA16tec	.1358404	.119465	.0163754	.0110936
Tea16s4p	.0699775	.0548426	.0151349	.013817
NES17ISUM_~9	.1792707	.6259313	-.4466606	.2200993

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 9.75
Prob>chi2 = 0.2828
(V_b-V_B is not positive definite)

Picture 20 Hausman test

Appendix 7. Stata output for male established business model

Source	SS	df	MS
Model	352.554089	8	44.0692611
Residual	1188.83636	110	10.8076032
Total	1541.39044	118	13.0626309

Number of obs = 119
F(8, 110) = 4.08
Prob > F = 0.0003
R-squared = 0.2287
Adj R-squared = 0.1726
Root MSE = 3.2875

EB_16mal	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
EX16_RS3	-.25008	.0647557	-3.86	0.000	-.3784107	-.1217494
Ffail16m	.1216957	.0372465	3.27	0.001	.0478818	.1955096
Suskl16m	.0496609	.0338858	1.47	0.146	-.0174927	.1168145
Knoen16m	-.0226697	.0458289	-0.49	0.622	-.1134917	.0681524
NES17CSUM_MEAN9	.2219637	.3854687	0.58	0.566	-.5419447	.9858722
TEA16tec	-.2660355	.105467	-2.52	0.013	-.4750463	-.0570247
Tea16s4p	-.1035325	.0371221	-2.79	0.006	-.1770998	-.0299653
NES17ISUM_MEAN9	.2183723	.3493542	0.63	0.533	-.4739656	.9107103
_cons	9.99255	3.653223	2.74	0.007	2.75272	17.23238

Picture 21 OLS model for male established business

```
Random-effects GLS regression                   Number of obs      =       119
Group variable: countrynum                      Number of groups   =        30

R-sq:  within  = 0.1734                         Obs per group: min =         1
       between = 0.0406                                        avg =       4.0
       overall = 0.0547                                        max =         5

                                                Wald chi2(8)       =     16.88
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0313
```

EB_16mal	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
EX16_RS3	-.1076995	.0440409	-2.45	0.014	-.194018	-.021381
Ffail16m	-.0212575	.0539093	-0.39	0.693	-.1269177	.0844027
Suskl16m	.0970682	.048853	1.99	0.047	.0013182	.1928183
Knoen16m	.023383	.0536213	0.44	0.663	-.0817129	.1284788
NES17CSUM_MEAN9	.105753	.3882333	0.27	0.785	-.6551703	.8666763
TEA16tec	-.0656215	.0663292	-0.99	0.323	-.1956244	.0643814
Tea16s4p	-.0453968	.0314731	-1.44	0.149	-.1070829	.0162893
NES17ISUM_MEAN9	-.0514324	.3699772	-0.14	0.889	-.7765744	.6737096
_cons	7.829708	3.744912	2.09	0.037	.4898153	15.1696
sigma_u	3.1331145					
sigma_e	1.6019316					
rho	.79275865	(fraction of variance due to u_i)				

Picture 22 Random-effects model for female established business

```
Breusch and Pagan Lagrangian multiplier test for random effects

        EB_16mal[countrynum,t] = Xb + u[countrynum] + e[countrynum,t]

        Estimated results:
                             |       Var     sd = sqrt(Var)
                    ---------+------------------------------
                    EB_16mal |    13.06263       3.614226
                           e |    2.566185       1.601932
                           u |    9.816406       3.133114

        Test:   Var(u) = 0
                                 chibar2(01) =     95.31
                              Prob > chibar2 =    0.0000
```

Picture 23 Breusch and Pagan Lagrarian test

```
Fixed-effects (within) regression               Number of obs      =       119
Group variable: countrynum                      Number of groups   =        30

R-sq:  within  = 0.2279                         Obs per group: min =         1
       between = 0.0005                                        avg =       4.0
       overall = 0.0012                                        max =         5

                                                F(8,81)            =      2.99
corr(u_i, Xb)  = -0.6069                        Prob > F           =    0.0055
```

EB_16mal	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
EX16_RS3	-.0944253	.0449236	-2.10	0.039	-.1838091	-.0050414
Ffail16m	-.1654868	.0729175	-2.27	0.026	-.3105698	-.0204038
Suskl16m	.191024	.0747941	2.55	0.013	.0422073	.3398407
Knoen16m	.027546	.066787	0.41	0.681	-.1053391	.1604311
NES17CSUM_MEAN9	.2056306	.4445788	0.46	0.645	-.6789417	1.090203
TEA16tec	-.0493274	.0666682	-0.74	0.462	-.1819762	.0833214
Tea16s4p	-.0158679	.0341494	-0.46	0.643	-.0838146	.0520788
NES17ISUM_MEAN9	-.2294984	.4279663	-0.54	0.593	-1.081017	.6220204
_cons	7.302189	4.826698	1.51	0.134	-2.301425	16.9058
sigma_u	4.1858169					
sigma_e	1.6019316					
rho	.87224806	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(29, 81) =    13.18                 Prob > F = 0.0000
```

Picture 24 Fixed-effects model for female established business

	Coefficients (b) fem2	(B) rem2	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
EX16_RS3	-.0944253	-.1076995	.0132742	.0088618
Ffail16m	-.1654868	-.0212575	-.1442293	.0490995
Suskl16m	.191024	.0970682	.0939558	.0566351
Knoen16m	.027546	.023383	.004163	.0398152
NES17CSUM_~9	.2056306	.105753	.0998776	.2166222
TEA16tec	-.0493274	-.0656215	.0162941	.0067143
Tea16s4p	-.0158679	-.0453968	.0295289	.0132526
NES17ISUM_~9	-.2294984	-.0514324	-.178066	.2151093

```
                b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =       25.71
                Prob>chi2 =      0.0012
                (V_b-V_B is not positive definite)
```

Picture 25 Hausman test

Linear regression, absorbing indicators

Number of obs	= 119
F(8, 81)	= 2.99
Prob > F	= 0.0055
R-squared	= 0.8651
Adj R-squared	= 0.8035
Root MSE	= 1.6019

EB_16mal	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
EX16_RS3	-.0944253	.0449236	-2.10	0.039	-.1838091	-.0050414
Ffail16m	-.1654868	.0729175	-2.27	0.026	-.3105698	-.0204038
Suskl16m	.191024	.0747941	2.55	0.013	.0422073	.3398407
Knoen16m	.027546	.066787	0.41	0.681	-.1053391	.1604311
NES17CSUM_MEAN9	.2056306	.4445788	0.46	0.645	-.6789417	1.090203
TEA16tec	-.0493274	.0666682	-0.74	0.462	-.1819762	.0833214
Tea16s4p	-.0158679	.0341494	-0.46	0.643	-.0838146	.0520788
NES17ISUM_MEAN9	-.2294984	.4279663	-0.54	0.593	-1.081017	.6220204
_cons	7.302189	4.826698	1.51	0.134	-2.301425	16.9058
countrynum	F(29, 81) =		13.182	0.000	(30 categories)	

Picture 26 Fixed-effects model for female established business with ABSORB function in STATA